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# Wood Preservation

## WOLMAN SALTS

REG. TRADE MARK

A UNIVERSAL WOOD PRESERVATIVE





# WOLMAN SALTS

A UNIVERSAL  
WOOD PRESERVATIVE

DEMONSTRABLY ACCOMPLISH MORE IN  
PROTECTION OF WOOD THAN ANY  
OTHER KNOWN METHOD OF  
SALT TREATMENT.

IT IS NOT POSSIBLE TO  
SUCCESSFULLY IMITATE ALL ITS PROPERTIES.  
DO NOT ACCEPT SUBSTITUTES.



(C. 1935)

## AMERICAN LUMBER & TREATING CO.

37 WEST VAN BUREN ST., CHICAGO, ILL.

NEW YORK, N. Y.  
122 E. 42ND ST.

BOSTON, MASS.  
10 HIGH ST.

ST. LOUIS, MO.  
ARCADE BLDG.

SAN FRANCISCO, CAL.  
RIALTO BLDG.

SHREVEPORT, LA.  
509 MARKET ST.

GAINESVILLE, FLA.  
E. JACKSON ST.

LOS ANGELES, CAL.  
1031 SO. BROADWAY

# **T**HE PURPOSE OF THIS BOOKLET • • •

is to furnish such technical data  
and service records as are essen-  
tial to an understanding of the  
**WOLMAN SYSTEM**  
of wood impregnation, now well  
known in American practice and  
with nearly thirty years of success-  
ful history in European service.





# WOLMAN SALTS

## A UNIVERSAL WOOD PRESERVATIVE

**W**OOD, with its natural properties of resilience to absorb shock, low conductivity, great strength per unit of weight, lightness and ease of handling, widespread availability, and moderate cost, has so many advantages that there is no need for substitutes when these natural properties are dependably maintained.

**C**HEMICAL treatment of wood is an established factor of modern construction methods. Wood preservation has passed through one hundred years of experiments that have clearly established the economic advantages it has to offer. Most of the vexing problems in connection with methods of wood impregnation have been solved, so that it is now possible to treat suitable grades of wood with deep penetration of effectively protective chemicals that will stay in the wood even under exposure to extreme weather conditions or adverse location.

**WOLMAN SALTS** are properly termed the **UNIVERSAL WOOD PRESERVATIVE** because they are admirably suited for use in every application of wood where there is exposure to conditions that might cause premature deterioration by decay, or disintegration brought about by termites. There are no objectionable characteristics whatever imparted to the wood that could possibly interfere with its adaptability.

**T**HERE are two mixtures of Wolman Salts in general use. To distinguish between them readily, the two forms in which Wolman Salts are offered are identified by the trade names Triolith and Tanalith.

**TRIOLITH** is a combination of toxic chemicals with all the preservative value against decay and with powerful fibre fixation, differing from the other Wolman Salt mixture in that there is no arsenic content.

**TANALITH** is a combination of the same chemicals with the addition of arsenic salts, the best chemical known for specific resistance to termite attack. There is the same toxic value against decay organisms and the same high value of fibre fixation. Especially is the arsenic so strongly fixed in difficultly soluble form, that there is no leaching or exudation possible.

The fluoride-phenol-chrome combination known as Wolman Salts offers the following advantages, as a wood preservative.

1. **PRESERVATIVE VALUE** due to its toxicity, ranging in laboratory tests from 8 to 10 up to 30 times that of other commonly known salts treatments.
2. **CLEANLINESS** of the treated product, which has no objectionable odor or discoloration and can be given a desired surface finish with any sort of paint or varnish.
3. **PERMANENCE**, resulting from the characteristics of the ingredients—low solubility, strong fibre fixation, and the fact that they do not attract water nor are themselves drawn by external moisture.
4. **ECONOMY**, offering the lowest cost rate per unit of toxicity of any of the chemicals or mixtures offered as wood preservatives.
5. **DEPENDABILITY**, vouched for by the best records of performance in long service, as well as by laboratory and test experiments.
6. **FIRE RETARDATION**, which is incidental to the use of any metallic salt treatment. The amount of retardation of inflammability and combustibility of wood depends upon the character and quantity of the impregnated salts.
7. **TERMITE PROTECTION**, for which Wolman Salts (Tanalith) is used, has proven by many years of actual service in the tropics to be superior to that secured from any other preservative.
8. **NON-CORROSIVE**—Wolman Salts permits no reaction when coming into contact with metal fastenings, such as nails, spikes, etc.

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salt, the removal of water soluble preservative can only occur in one of three ways:

1. Water finding its way into the interior, dissolving the salt, and running out again as water in liquid form. This can only occur under very unusual circumstances, the resistance opposed by wood to movement of water through its structure being very great.
2. Movement of the salt, under the attraction of external moisture, toward the surface of the timber whence it might be washed away by rain water or blown away after drying by air currents. This will take place in the case of a hygroscopic salt, but the inertness of the WOLMAN SALTS ingredients assures against this form of removal. There cannot be any movement of the WOLMAN SALTS due to the powerful fixation of the dyelike character of the ingredients that make up the preservative. It is actually dyed into the wood, much in the same manner as fast dye is put into fabric.
3. Diffusion will take place whenever a strong solution of salt is in contact with another body of water, unless there has been a powerful fixation of the salts within the wood fibres. The degree to which this osmosis occurs depends upon completeness of solution of the salts in the interior and the intimacy of contact of such interior solution with standing water outside. Under all practical conditions it is likely to be very slow, as the penetration of water into the interior of timber to such an extent as to provide the actual liquid contact necessary for such diffusion, requires many days immersion and in service conditions such long continued immersion does not normally occur except in piling.

The practical experience with timbers under very extreme conditions of moisture such as in some of the deep, wet and very warm Silesian mines, where long stretches of Wolmanized framing erected in 1911 are still in good condition with their bases in running water, gives effective practical support to the above considerations.

There is absolutely no hazard of poisoning from Wolmanized lumber. The quantity of salt on the surface, or in such volume of wood as might for example be nibbled from a manger by horses, is too small to cause any noticeable effect, and the salts are deposited in the fibres of the wood so firmly and in such difficultly soluble form, that there is no danger. Buildings of Wolmanized lumber have been in use for many years for all sorts of purposes, even as commissary buildings for foodstuffs, and there has never been any case of any kind of trouble.


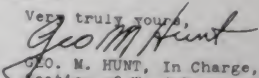
## 4. Economy

Everybody is familiar with the idea of selling coal on the basis of its heat unit content. And all mines dispose of their ore on the basis of the value of metal content. It would seem a most logical procedure to

purchase a wood preservative on the basis of its toxicity. So considered, WOLMAN SALTS would have to be looked upon not only as the best of the chemical preservatives in the market, but the cheapest as well. A reference to the toxicity table under subdivision 1 supplies the basis for comparison. One pound of WOLMAN SALTS provides 6 or 8 gallons of treating solution. The cost per gallon is in the neighborhood of  $4\frac{1}{2}\phi$ , and the amount of preservative used per cubic foot averaging  $2\frac{1}{2}$  gallons provides a treatment less expensive than any that can be classed as equivalent to it and considerably less expensive than most methods that offer any comparable protection.

## 5. Dependability

The very stable chemical character of the WOLMAN SALTS, and the fact that they can be produced with a high degree of uniformity and great purity; the readiness with which correct solutions can be prepared and controlled; the general experience in a large number of treating plants that when properly applied with the prescribed vacuum and pressure, a complete and uniform diffusion throughout all treat-

UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE FOREST PRODUCTS LABORATORY		MADISON, WISCONSIN
ADDRESSED ONLY TO DIRECTOR AND REPLY TO RPL2		May 1, 1928.
American Lumber & Treating Corp., 1138 Lake Shore Drive, Chicago, Ill.		
Subject: Wolman salts		
Gentlemen		
I am glad to have the information contained in your letter of April 30.		
Data as specific as this gives one a much better idea of what is going on than the general statements one usually hears. It is pleasing to us to note the increasing use of treated lumber in buildings and we think you have been wise in concentrating upon this field where you have a minimum amount of competition with other materials and <u>practically an equal break with any material when it comes to records of past performance.</u>		
I note with especial interest the items being treated at the Carbondale, Ill. plant. I did not know that any Wolman salts treatments were being made at Carbondale. Is this work being done by the Ayer and Lord Tie Company or by some other treating company?		
Very truly yours,  GEO. M. HUNT, In Charge, Section of Wood Preservation.		



able sections of the wood is secured; warrants the claim for genuine dependability. Manufacture is under the closest control, insuring absolute uniformity. There is an extensive list of satisfied users of WOLMAN SALTS and a record of successful installations of such great variety and extent as to well earn its classification as a dependable, universal wood preservative. Some of the items proving dependability have been referred to under heading No. 1, and it is to be noted that all the more important records have been amply verified by visits and careful inspections made by impartial American technicians.

The argument is sometimes advanced that there is undue checking of timbers treated with chemical solutions. This is to be definitely expected from all chemicals that have either an acid or alkaline reaction and is likely to be exceedingly severe when either the solutions themselves or subsequent breakdown of the chemicals used produce either acid or alkaline conditions in the wood. The complete neutralization of the WOLMAN SALTS solutions and the great stability of the salts used insure against any such effect.

## 6. Fire Retardation

WOLMAN SALTS of themselves happen to lend a certain degree of fire retardation and in addition to their chemical stability permit, without any difficulty whatever, the addition to the solution of other salts, principally borates and phosphates, which furnish the highest available degree of fire retardation.

If to the 2% WOLMAN SALTS solution an addition of our recommended Fire Protection Salt (a carefully worked out combination of fire retardant salts best suited to check inflammation and combustion) is made, the wood is very nearly equivalent to fireproof material; and far better than any fireproofing in that it retains all the valuable characteristics of wood, such as its resiliency and elasticity.

### CITY OF CLEVELAND DEPARTMENT OF PUBLIC SERVICE DIVISION OF ENGINEERING AND CONSTRUCTION

ROBERT HOFFMANN  
COMMISSIONER

February 24, 1931.

F. A. Weaver,  
6007 Euclid Ave.,  
Cleveland, Ohio.

Dear Sir:

I have tested samples of yellow pine lumber treated with Wolman salts, taken from lumber furnished the City of Cleveland for the E. 55 St. frame bridge. I find it much more fire resistant than untreated yellow pine. Under the particular test method used, in order to ignite the treated lumber, it required a length of time which was 15 times that required to ignite the untreated lumber.

Very truly yours,

*W. D. Pack.*

W. D. Pack

Engineer of Tests.

WDP:N



E. R. KINSEY, PRESIDENT  
W. E. ROLFE, ASSOCIATE

DEPARTMENT OF THE PRESIDENT  
BOARD OF PUBLIC SERVICE

### CITY OF ST. LOUIS, MISSOURI.

June 18, 1929.

Mr. Julius Seidel,  
President, Julius Seidel Lumber Co.,  
2200 S. Kingshighway,  
St. Louis, Mo.

Dear Mr. Seidel:

On numerous occasions you have sought to impress me with the advantages of timber treated by the Wolman process. Permit me now to give you two disadvantages of timber so treated.

During cool weather this spring a watchman on the job where some of this timber is being used sought to build a fire in his shanty. He attempted to start his fire with Wolmanized wood and could not even start it. He then got some packing case material and started a fire on which he placed chunks of wood cut from Wolmanized ties. These failed to burn. It was only after he placed coal on the fire and then Wolmanized wood on the coal that he was able to char it. From this it is quite obvious that Wolmanized treated wood is absolutely worthless as fire wood for watchmen's shanties.

The second disadvantage is this: Our work is located in a neighborhood where a large number of children constantly gather up chips and discarded wood to take home for fire wood. For a number of days they kept our job nicely cleaned up, and then they stopped coming for it. We were then put to the expense of cleaning up all the chips and debris of this wood because the neighbors seemed to find this material to be worthless as fire wood.

In cataloguing the advantages for this material you might put these two disadvantages on the other side of the count.

Yours very truly,

*E. R. Kinsey*

President, Board of Public Service.



## 7. Termite Protection

An exceptionally interesting record has been made by WOLMAN SALTS in Central America, where ties, telegraph and telephone poles, wood trestles, bridge timber, platforms and docks, fences, buildings of all sorts, including office buildings, warehouses, dwellings and farm buildings, have been Wolmanized. These are now in their twelfth year of service. Conditions in the district where they have been applied are so severe that they can already be quoted as an outstanding demonstration of the efficacy of the treatment with WOLMAN SALTS. Although a total of over forty million feet board measure have been installed in the Tropics to date, the record of decay prevention is of the highest order and no termite attack whatever has been discovered. WOLMAN SALTS should be specified in all cases where termites are prevalent.



### STANDARD FRUIT AND STEAMSHIP COMPANY

IMPORTERS

BANANAS &amp; COCONUTS

GENERAL OFFICE  
NEW YORKSOUTHERN OFFICE  
NEW YORKCABLE ADDRESS  
STANFRUCCO

NEW ORLEANS

March 14th, 1934.

Mr. C. Makutchan, Research Engineer,  
Board of Building & Safety Commissioners,  
Los Angeles, Cal.

Dear Sir:-

As requested by Mr. R. M. Morris, I am pleased to cite for your information and for the Board of Building and Safety Commissioners of the City of Los Angeles, the results obtained in our operations in Central America for the protection of building lumber from attack by termites, with the wood preservatives we have employed.

The locations in question are all such as to provide severe exposure to termite attack, untreated wood often being badly damaged soon after erection.

The protection afforded by creosote against termite attack has never been satisfactory, where the creosote had not penetrated it being necessary after a few years to start costly replacements, in buildings, bridges and other such structures.

In 1925 we began the use of Wolman Salts (Tanalith) principally on account of the termite protection afforded, as our standard treatment for all lumber in house building construction.

The treating operation for both creosote and Wolman Salts, has been carried on, with few exceptions, in our own treating plants.

We have treated approximately thirty five million feet of lumber to date with Wolman Salts. During the nine years of our experience, we have not discovered a single piece of wolmanized lumber that has been attacked by termites.

If you desire further information, will be glad to furnish you with any information I have on the subject.

Yours very truly,  
*John R. Ray*  
Foreign Department.

LJN:

### HEALTH DEPARTMENT

CALVIN L. COOPER, M. D.  
DIRECTOR  
MRS. MARGARET SHEPARD  
SECRETARY  
PORTER E. WILLIAMS, M. D.  
SUPT. OF GENERAL HOSPITAL NO. 1  
D. M. MILLER, M. D.  
SUPT. OF GENERAL HOSPITAL NO. 2



MRS. JOSEPHINE BRUNK  
SUPT. OF TUBERCULOSIS HOSPITAL  
O. C. MURPHY  
COMMISSIONER OF INSPECTION  
AND SANITATION  
D. M. NIGRO, M. D.  
COMMISSIONER OF CHILD HYGIENE  
AND COMMUNICABLE DISEASES  
MISS MARGARET M. CROWE  
ASSISTANT REGISTRAR OF VITAL  
STATISTICS AND RECORDS

### KANSAS CITY, MISSOURI

H. F. MCELROY, CITY MANAGER

March 14, 1931.

Mr. R. M. Morris,  
332 S. Michigan Ave.,  
Chicago, Ills.

Dear Sir:

Termites or "White Ants" have done and are still doing considerable damage to buildings in this city. The general public has become acquainted only in the last two or three years with the habits and workings of termites through a great deal of publicity given in local newspapers. Primarily it is not a health problem. However it is the general public opinion that it is a matter for the Health Department to investigate.

This Department has been besieged by the manufacturers of hundreds of remedies claiming to be effective in termite control. There are no known insecticides of any permanent value for use in buildings. Such damage can be prevented by the proper construction of buildings and by chemical treatment of wood. In buildings already constructed the problem is that of replacement when possible.

After careful consideration of the many suggested remedies the department found that Tanalith, "Wolman Salts", is a most effective aid in control work. After careful experimentation with this product over a period of three years we are ready to recommend its use. There are other known wood treating chemicals that are valuable and have their places in the wood treating industry. However for the purpose intended Tanalith is outstanding.

I heartily recommend this product as a clean, effective, odorless method of treating timbers for replacement work in checking destruction of termites, when used with the full knowledge of its limitations.

Yours very truly,

DIVISION OF INSPECTION AND SANITATION

OCM:MLM

*O. C. Murphy*  
O. C. Murphy, Commissioner.

## 8. Non-Corrosive

Since the lumber-treating equipment is made of metal, a solution which would attack the metals of this equipment should not be used.

WOLMAN SALTS is neither an acid nor an alkali. Therefore, it is positively neutral in the presence of iron or any of the common metals that may be used as fastenings, such as nails, spikes, screws, etc. No chemical reactions will take place—no corrosion will result. This is due to the presence of the neutralizing metallic chromates in the WOLMAN SALTS. The chromium salts' passivating effect against corrosion or oxidation extends to protection of the wood, itself, greatly retarding what is generally referred to as weathering, and so maintaining elastic freshness in wood.





# PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

INSPECTING ENGINEERS AND CHEMISTS

STEVENSON AND LOCUST STREETS

PITTSBURGH, PA.

## REPORT UPON AN INVESTIGATION of WOLMAN SALTS AS A WOOD PRESERVATIVE TREATMENT for PROTECTION AGAINST DECAY AND TERMITES

May 25, 1933

Lab. No. 162739

### INTRODUCTION

The following report presents the results of an investigation made to determine the effectiveness against decay and termites of Wolman Salts, a preservative treatment for wood developed in Germany and later introduced into this country.

Briefly, the treatment, termed Wolmanizing, consists of impregnating wood by a vacuum and pressure process with certain salts for the purpose of inhibiting decay and attack by termites.

The investigation consisted of a study of literature upon the subject of wood preservation, field surveys in this country and Central America of Wolmanized timber in actual use, and laboratory tests checking and supplementing the findings in the field.

Study of the details of the investigation and tests made of Wolman Salts has led the following conclusions:

### CONCLUSIONS

#### DECAY

Wolman Salts, when properly used as a wood preservative treatment, will protect wood so treated by preventing or inhibiting decay.

This conclusion is based upon the following:

- a) The reliably reported successful use of Wolman Salts in Central Europe
- b) The fact that no traces of decay were found in installations examined by us in the United States. These included installations up to eight years of age.
- c) The fact that decay of Wolmanized wood examined by us in the tropics has been almost negligible, installations up to nine years of age being examined.
- d) The finding of Wolman Salts in the heart as well as outer sections of specimens of Wolmanized wood, that had been in service for various lengths of time up to nine years.

#### ATTACK BY TERMITES

Wolman Salts (Tanalith), when properly used as a wood preservative treatment, will protect wood so treated by preventing or inhibiting the attack by termites.

This conclusion is based upon the following:

- a) The fact that no evidence of termite attack upon Wolmanized wood was found in the installations examined by us in the United States.
- b) The fact that we failed to find or learn of a single case of termite attack upon Wolmanized wood in the survey in Central America, of the Standard Fruit & Steamship Company's properties. This company has used 35,000,000 feet of Wolmanized lumber there during the last nine years.
- c) The finding of Wolman Salts by chemical analysis in all parts of specimens of Wolmanized wood taken after exposure to severe conditions in the tropics for various lengths of time up to nine years

#### WOLMANIZING PROCESS CONTROL

Proper supervision and control of the Wolmanizing process and means of easily identifying properly treated wood are essential.

Wolmanizing is a technical process, involving such considerations as the use of the proper amount of Wolman Salts in the treatment; the maintenance of solution temperatures within the prescribed limits; the accurate control of vacuum; and the continuation of treatment for the requisite time.

Even an informed person can not judge by visual inspection whether wood has been properly Wolmanized. Obviously, for the benefit of the buyer and seller, some means of easily identifying it should be used.

Respectfully submitted,

PITTSBURGH TESTING LABORATORY,

President.



# Laboratory and Inspection Service

## Insures Proper Treatment of Lumber

The American Lumber & Treating Co. exercises the utmost care to insure to the user, an effective and correctly Wolmanized product.

Wolman Salts are manufactured, under bond, by the foremost manufacturing chemists; only the purest of chemicals are used, insuring absolute uniformity.

Wolmanized Lumber is treated by the American Lumber & Treating Co., or under its supervision with genuine Wolman Salts preservatives marketed by the American Lumber & Treating Co., and protected by its U. S. patents.

Under special arrangements with the Pittsburgh Testing Laboratory of Pittsburgh, Pa., an international fact finding institution, one of their salaried inspectors is located at all our own treating plants. He supervises and checks the entire treating operation in order to certify that treatment is applied in strict accordance with specifications.

All material so inspected is branded with the Pittsburgh Testing Laboratory's certified stamp.

See to it that your supplier furnishes lumber and other forest products branded with this symbol. It is your guarantee of protection against attack of decay and termites.

This authoritative brand certifies to treatment and protection when it appears on Wolmanized Forest Products.

Specifications should be written to insure that Genuine Wolman Salts are used, which will insure

good treatment and lasting satisfaction.

The science of Wood Preservation is a highly specialized subject. The Company's chemists and engineers have for years made a careful, conscientious study of the many problems involved.

Besides one of the most completely equipped and efficiently manned chemical and mycological research laboratories under the direct supervision of Dr. ing. h.c. Karl H. Wolman, in Berlin, a well fitted laboratory for investigations and the handling of problems in wood preservation and the use of Wolman Salts, is maintained in Chicago, to serve treating plants and users of Wolman Salts.

The American Lumber & Treating Co. offers the full cooperation of their Research Department and engineers to assist the architect, engineer, lumber retailer and contractor in solving questions that might arise relative to the use of Wolmanized materials and sources of supply best suited to serve any locality.

A letter, telegram or telephone call to any of our offices will secure all available information required at once, or arrangements will be made to send to your office an engineer fully qualified to consult with you and render assistance. The Company will appreciate the opportunity to work with you in securing longer lived wood construction and the maximum economy which is now obtainable with Wolman Salts treatment.



"Wolman Salts" and "Wolmanized Lumber" are registered trademarks of the American Lumber & Treating Co. The above seal branded on forest products is your guarantee of genuine "Wolmanized" material and its protection against decay and termites.



*A view of the Chemical Section, Chicago Laboratory.*



*Experimental retort, Chicago Laboratory.*



## RECOMMENDED SPECIFICATIONS FOR TREATING LUMBER WITH WOLMAN SALTS

All the timber specified to be Wolmanized, shall be given a pressure treatment of High Fixation Wolman Salts.

### THE PRESERVATIVE

- A { The Wolman Salts (Triolith) mixture shall be composed essentially of the following ingredients for protection against DECAY:  
Sodium Fluoride, dinitro-phenol, and neutralizing chromates. (Free of Arsenic.)
- B { The Wolman Salts (Tanalith) mixture shall be composed essentially of the following ingredients for protection against DECAY and TERMITES:  
Sodium Fluoride and arsenate, dinitro-phenol, and neutralizing chromates.

### TREATMENT

The treating solution shall generally have a strength of concentration in water of from 1.8 to 2% of Wolman Salts, in 98.2 to 98% of water; but the solution shall be no stronger than necessary to obtain the required retention of preservative specified below, with the largest volumetric absorption practicable.

All lumber should be kiln dried or air seasoned until moisture content is below 20%. All large timbers should be air seasoned until moisture content is below 23%. Green timber, poles or piling must be given an artificial seasoning in an airtight retort by a bath of live steam at from 10 to 15 pounds pressure for a period of from 4 to 10 hours, followed by a vacuum of at least 22" for one hour, or with alternating periods of vacuum and pressure, as may be found necessary to put the timber into condition for treatment. The cylinder shall be relieved continuously or frequently enough to prevent condensate from accumulating in sufficient quantity to reach the wood. After the above process, or in the case of air seasoned timber after a vacuum period at not less than 22" for at least 15 minutes, the preservative solution, maintained at a temperature of between 120 and 180 degrees Fahrenheit, shall be admitted into the treating cylinder, without breaking the vacuum until timber is completely submerged. The preservative solution shall then be pumped into the timber under pressure sufficient to secure the desired absorption, or if this cannot be attained then under a pressure of 150 pounds per square inch continuing until the charge is treated to refusal. The solution shall then be quickly drained off, and the timber may be left in the cylinder to drip for about 30 minutes, or a quick final vacuum, at no time greater than the minimum vacuum during submergence, may be created and maintained until the charge can be removed from the cylinder free of dripping preservative; or preferably final air pressure of 50 pounds for 15 minutes and then 75 pounds for 15 minutes may be applied.

For Douglas Fir, the artificial seasoning and treatment requires special care. Above temperatures and pressures must be so controlled as to not cause collapse or distortion.

The amount of solution injected into the timber and its strength of concentration must be so controlled as to leave not less than (\*) pounds of dry salt for each cubic foot of timber treated, and this shall permeate all of the sap wood and as much of the heart wood as practicable. No charge shall contain less than 90% nor more than 110% of the quantity of preservative specified.

(\*) Insert the desired final retention of dry salt content, which may be 1/4 or 3/10 pound for ordinary building work, or for ties, poles and outside construction 3/10 pound or more of Wolman Salts for each cubic foot of the treated wood. Higher retentions may be specified, such as 4/10 pound, 1/2 pound, or 3/4 pound per cu. ft. when there is exposure to exceptionally severe conditions in service, which, in the judgment of the specifying engineer, call for exceptionally high protective values from the treatment.

NOTE—After treatment the lumber should be kiln dried or properly piled and allowed to dry before using, to allow for fixation of the preservative and to insure against excessive shrinkage after being put into service.

When the lumber is to be painted or varnished, it is imperative that the wood be dry before applying paint or varnish.

## AMERICAN LUMBER & TREATING CO.

37 WEST VAN BUREN ST., CHICAGO, ILL.

NEW YORK, N. Y.  
122 E. 42ND ST.

SHREVEPORT, LA.  
509 MARKET ST.

BOSTON, MASS.  
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LOS ANGELES, CAL.  
1031 SO. BROADWAY



# WOLMAN SALTS

## A UNIVERSAL WOOD PRESERVATIVE

### IN PRACTICAL SERVICE

The most important factor in establishing the value of a wood preservative is its performance, and the question most frequently asked about a wood preservative is, "What has it done under actual service conditions?"

"The life of lumber in service is the most important factor affecting the ultimate cost. It is not the initial expenditure but the cost during a period of years that must be considered in a study of relative economy. This fact is very often overlooked by the lumber user in a desire to avoid the higher initial cost of the more durable material. For this reason untreated lumber is often employed under conditions where treated lumber would be much more economical on account of its greatly lengthened period of service."—By J. D. MacLean, Engr., U. S. Forest Products Laboratory, Madison, Wisc.

### GENERAL BUILDING CONSTRUCTION

The purchaser of building material is prone to magnify the importance of additional first cost when approaching the problem as to whether or not he should use treated lumber and timber. When added first cost in preservative treatment is under consideration, it should be associated with the extended life of the lumber to be used beyond its untreated life, and the saving in material, labor and replacements should be the controlling factor in the calculation.

It is difficult to name a case where added cost for preservative treatment does not yield an actual return of more than 100% on the investment, and from that up to several hundred per cent.

The chemical treatment of building material permits the use of sap wood and cheaper native woods, which, in a great number of cases, are in reality better for the purpose intended but have not been utilized on account of the early decay when used untreated. This is particularly true of second growth sap woods.

By the elimination of heart content specification in lumber and timber, the cost of treatment may be partly or wholly absorbed, and, in many cases, the material treated can be furnished cheaper than where heart content is specified.

"The heartwood of Oak, Pine and Douglas Fir is not intrinsically stronger than the Sap wood as has often been supposed to be the case."—U. S. Forest Products Laboratory, Madison, Wisc., Technical Note No. 189.

While untreated sap wood is an invitation to early decay, it must be kept in mind that the more sap lumber used the more dependable is the penetration of the preservative, and, therefore, the longer the life of the wood, when treated.



## Textile and Paper Mills

In constructing a modern building to be used for manufacturing purposes, it is desirable to use wood in the construction for floors and roofs. It is a valuable insulating material and is comparatively cheap and readily adaptable to most any type of construction.

With the present-day method of air conditioning so that large percentages of moisture are constantly maintained, all engineers have experienced trouble with floor and roof timbers and planking decaying, due to the growth of fungus. For many manufacturing operations such high moisture in the air, and correspondingly high temperature, is essential or at least of advantage to the manufacturing process; so that the problem must be faced as to how to avoid the replacements that will be necessary in a very few years due to decay, if the wood is left unprotected. In addition to the purchase of new lumber, replacements

always involve high costs for labor in removal of the decayed materials and for installation under adverse conditions, besides serious losses from interruption of production.

The effective solution of this problem was reached in the Ballinger Company design for the first plant of the Viscose Company at Parkersburg, W. Va., by the specification of some four million board feet of Wolmanized lumber for roofing.

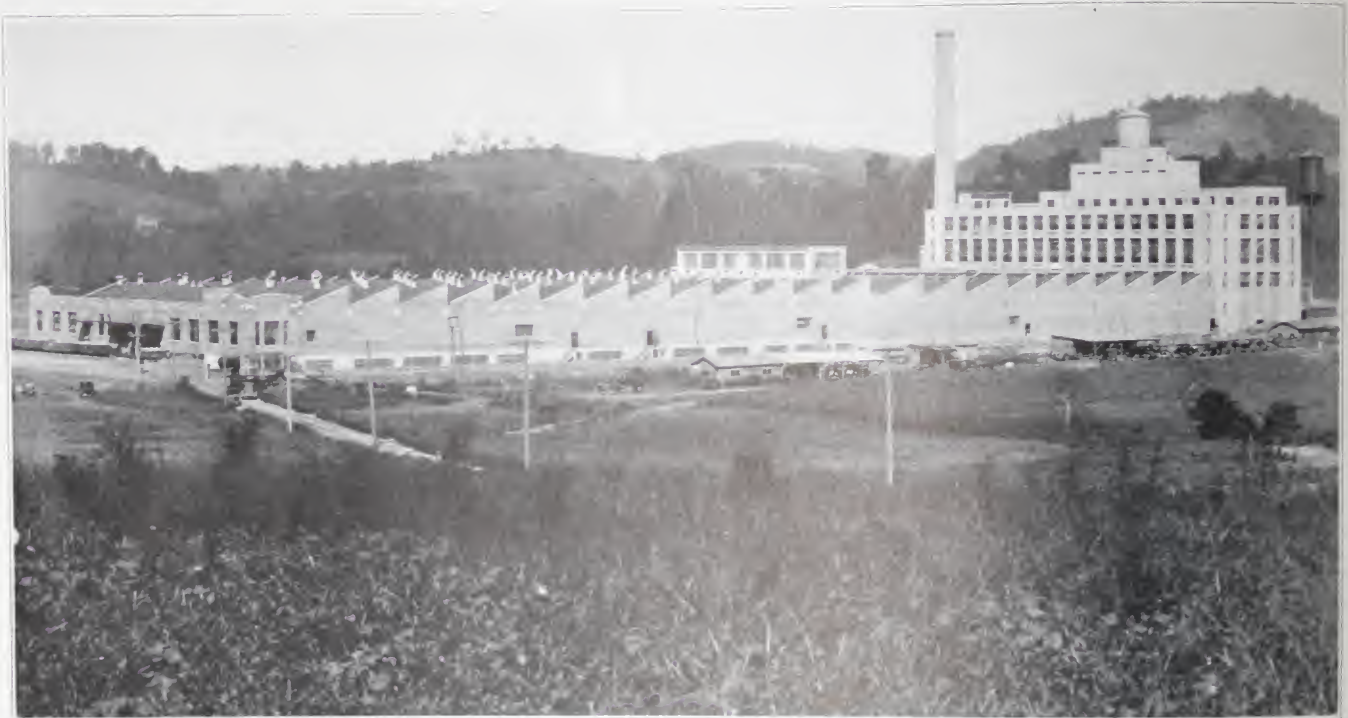
After their experience with the first installation, the Viscose Company, in succeeding years, has put large quantities of Wolmanized roofing, flooring, planking, and timbers into their plants at Roanoke, Va., at Lewistown, Pa., and at Meadville, Pa.

In many other textile mills, and in paper mills throughout the United States, lumber treated with Wolman Salts has been employed as a dependable element of permanent mill construction, effectively insured against decay and the possibility of its having to be replaced.

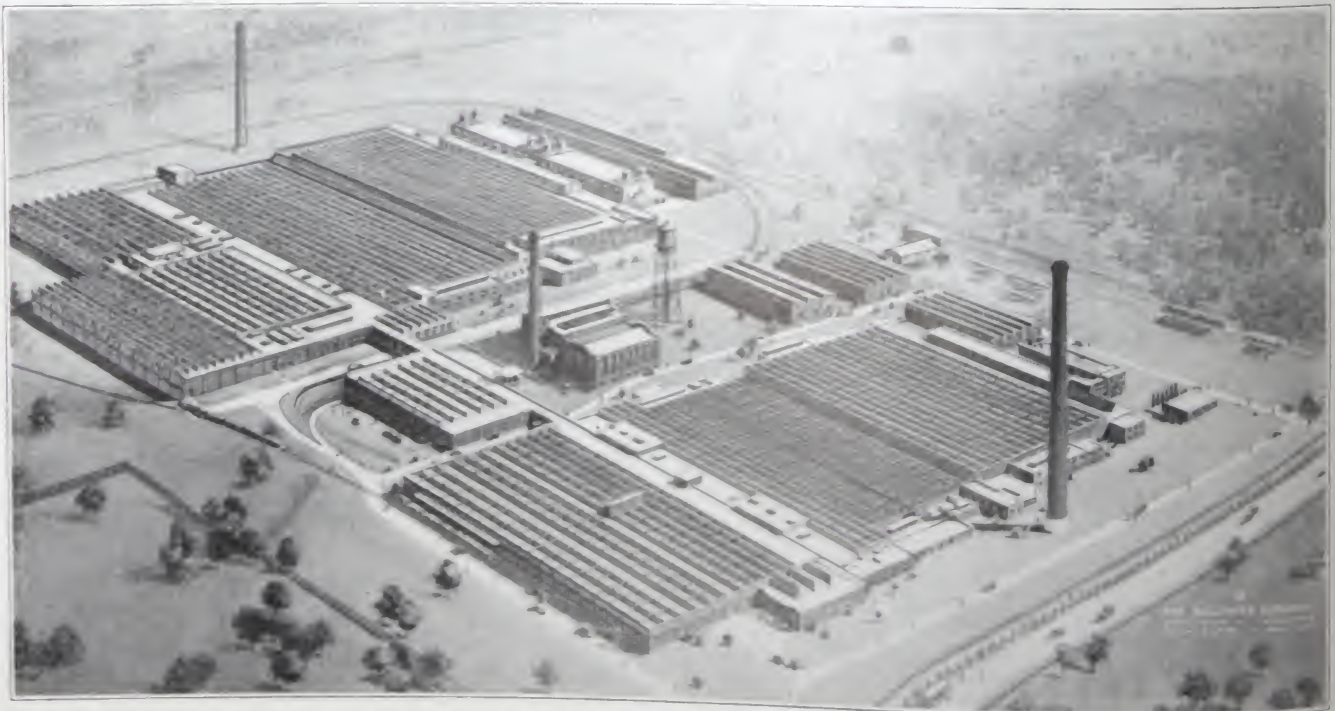


*Typical textile mill roof constructed of Wolmanized lumber. Mt. Hope Finishing Co., North Dighton, Mass.*





*Plant of American Bemberg Corp., Bemberg, Tenn. Construction of textile mills with Wolmanized lumber is preferred because of its great resistance to decay and the fact that it can be painted white or any color.*



*The Viscose Co., Parkersburg, W. Va. In this building over 4,000,000 feet of Wolmanized Roofing was used in construction. The Balinger Co., Engrs & Arch., Philadelphia, Pa.*

"BUILD TO ENDURE"



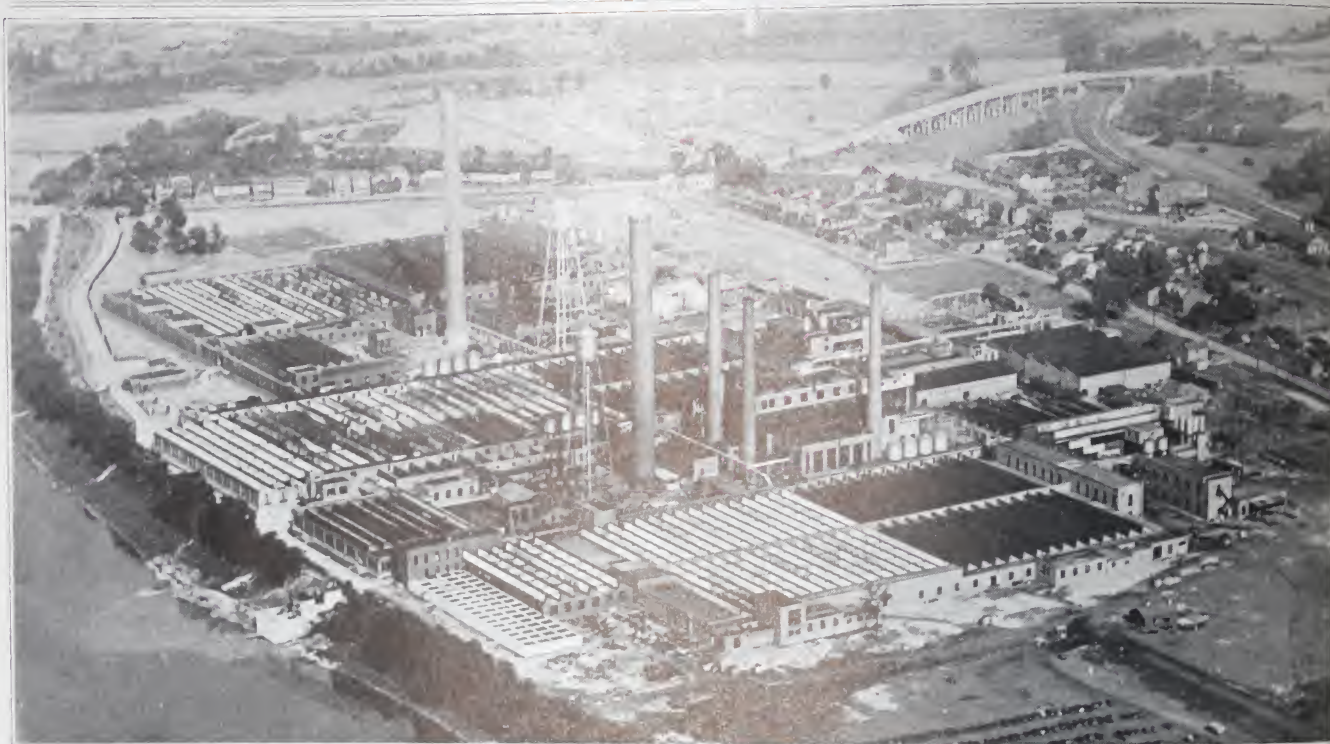


*Plant of the Mosinee Paper Mills Co., Mosinee, Wisconsin. Wolmanized lumber in roof construction.*



*Wolmanized lumber substructure in the Los Angeles warehouse of the Zellerbach Paper Co.*





*Lewistown, Pa., plant of Viscose Co. Over 2,000,000 feet of Wolmanized lumber used in construction of this plant.  
The Ballinger Co., Engineers & Architects, Philadelphia, Pa.*

## Factories

Lumber and timber treated with Wolman Salts for modern factory construction is being specified by the leading architects and engineers throughout the country, and Wolman Salts achieved one of its greatest triumphs when the International Shoe Company specified such material for the new buildings of their tannery at Wood River, Ill., and at Malvern, Ark., at Anna, Ill., and at Washington, Mo.

The varied conditions to which the treated lumber

was exposed there; abundant moisture with high temperature in some rooms, fumes from the vats or corroding drip from the hides in others, all provided a very severe test that has been successfully met by the Wolmanized products.

The Master Mechanic of this tannery reports that the untreated wood floors of their hide seasoning bins had to be renewed every six months. After four years service in these same floors, Wolmanized lumber is still in perfectly good condition. This represents a saving of eight costly replacements already.



*International Shoe Co. tannery at Wood River, Ill., where Wolmanized lumber has strikingly demonstrated its efficacy under conditions of severe exposure. Lumber furnished by Julius Seidel Lbr. Co., St. Louis, Mo.*

**"BUILD TO ENDURE"**



## Miscellaneous Industrial and Commercial Uses

The uses of Wolmanized lumber in industrial and commercial fields are so varied as to be almost impossible to classify. For that reason, the group of installations on this page and the next are merely examples, selected at random, of the scores of different industrial requirements for which Wolmanized lumber is so well fitted.

Laundries, bakeries, cotton gins and warehouses, where cleanliness and protection against decay in floors, roofs and window sash and frames are paramount, fences, billboards—all these require a treated lumber that is not only fully protected against decay and termites, but is dry, odorless, paintable, and can be depended upon for strength and elasticity.

In the oil industry, Wolmanized lumber has proven itself the ideal material in every use from the wells themselves to the service stations which retail the final product.



*Cotton gin and warehouses, Pickens, Ark. All lumber Wolmanized*

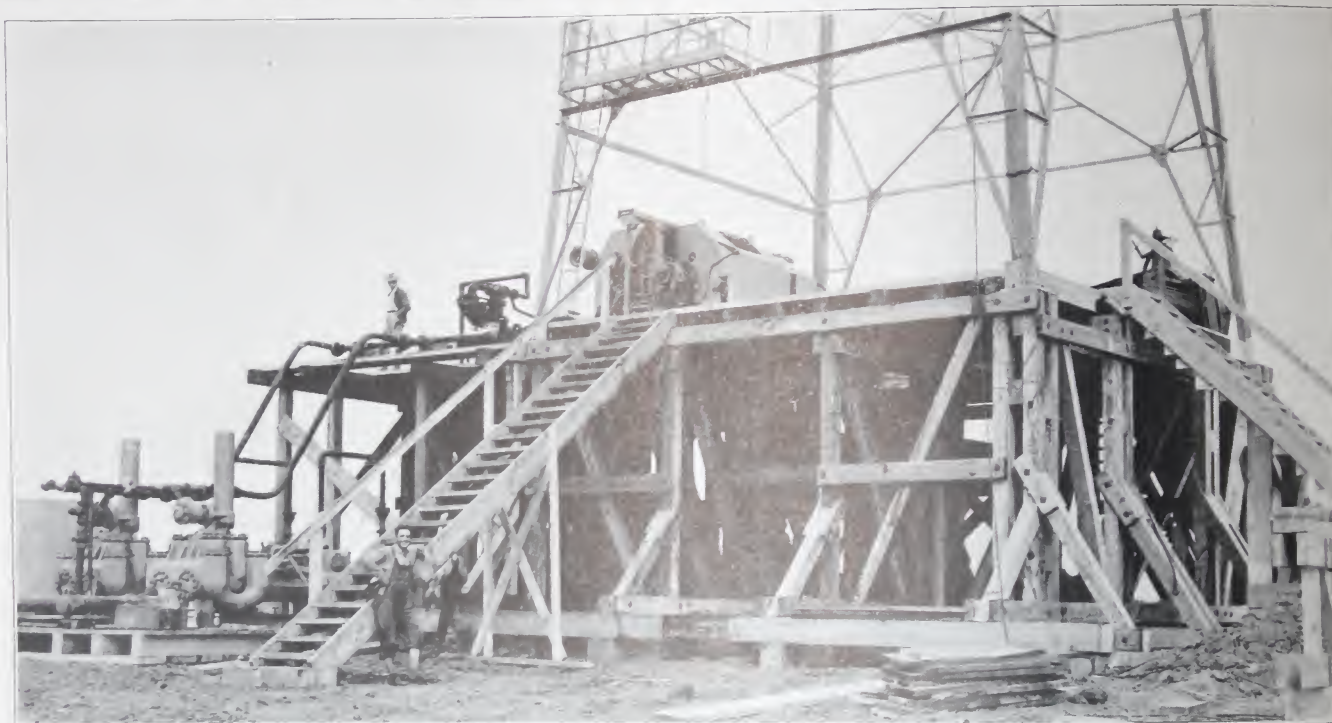


*Fence of Wolmanized lumber, illustrating an attractive design in wood fence construction.*



*This fence, of Wolmanized cedar posts and pine boards, surrounds the property of the Metal & Thermite Corp., East Chicago, Ind.*





*From well to consumer, Wolmanized lumber follows the oil industry. Derrick base of prefabricated Southern pine, designed for strength and simplicity by the Connector Construction Co., Houston, Texas. All fabrication completed before Wolmanizing.*



*Pipe rack designed and built by Connector Const. Co., of Wolmanized Southern pine.*



*Service station framed throughout with Wolmanized lumber. Fence also Wolmanized.*



*Tank base for field use. Protected by Wolmanizing after fabrication.*



## Central American Installations

The protection of frame buildings, poles, fences and other construction of wood against the destruction by termites, has long been an important and primary problem in the tropics and subtropics.

In Central America many million feet of Wolmanized material have been installed during the past twelve years with remarkably favorable results for use in telegraph and telephone poles; car material and lumber used for dock construction; loading platforms, fences, structures of all sorts, including both dwellings and farm buildings. This result despite the fact that the tropical condition in that section induces early decay and the universal infestation of termites.

The deep penetration possible in the Wolmanizing process, and the fact that a heavy full cell impregnation of the preservative can be secured without excessive cost, together with the high toxicity of the Wolman Salts ingredients both against the vegetable forms that produce decay, and against termites, explains the universal success that has resulted from the general use in tropical countries.


A large user in Central America is the Standard Fruit & Steamship Company, and in their operations, extending over an area of 300 miles or more, can be found all types of general construction, where Wolman Salts treated forest products have been used exclusively.



Commissary at San Blas, Panama, constructed entirely of Wolmanized lumber. Unlike other Central American buildings, it is free from insects and vermin.



Commissary and sleeping quarters at San Isobel. Built in 1926 of Wolmanized lumber.



**STANDARD FRUIT AND STEAMSHIP COMPANY**  
IMPORTERS  
**BANANAS & COCONUTS**  
General Office  
UNION TRUST BUILDING  
NEW ORLEANS, LA.  
NEW ORLEANS July 22nd, 1930.

Messrs: Ernest M. Loeb Co., Inc.,  
642 Canal Bank Bldg.,  
New Orleans, La.

Gentlemen:-

Reference to 'phone conversation with your Mr. Ernest Loeb, regarding the experience obtained from the use of Wolman Salts as a wood preservative in the Tropics, by the Standard Fruit & Steamship Co.

We were led to make our first experiments with Wolman Salts "Tanalith" on the basis of the following three points of advantage:-

- (1) High toxic values
- (2) Deep penetration
- (3) Certain degree of fixation on the wood fibres that promised permanence.

Our practical experience over a term of years have confirmed these features. At our treating plants we found accurate control of penetration and retention of salts quite possible with simple procedure. Examination of material some months after treatment showed penetration had proceeded quite deeply into the heartwood, a result we had not been able to obtain with other preservatives.

We have found the protection against termite attack to be universally effective; after six (6) years service no termite attacks have been recorded in any of the many different uses to which we have put Wolmanized lumber.

We began the use of Wolman Salts as a wood preservative in our Ceiba, Honduras treating plant in October 1924, and as a result of the satisfactory results obtained we are still continuing the use of Wolman Salts in a large measure.

We have treated to-date and put to practical use approximately 35 million feet of all classes of material; we have also wolmanized and shipped several large orders to our customers in adjacent islands.

Any further information you may desire, we will be pleased to furnish, if coming within the scope of our actual experience.

Trusting that the above will serve your purpose, we beg to remain,

Yours very truly,  
Standard Fruit & Steamship Company,  
*John R. Ray*  
John R. Ray,  
Foreign Department.

JRR:R



## Residential Buildings

Because of its light weight, strength, low cost and adaptability, wood is the ideal construction material for all types of residential buildings, garages, fences, etc. However, wood used in this field must be adequately protected by preservative treatment against the attacks of decay and termites.

Such treatment must be provided by a preservative that is free from unpleasant odors and contaminating exudation, and which permits finishing with any kind of paint or varnish with the assurance that the finish will hold as well or better than on untreated wood. Treatment with Wolman Salts fulfills these requirements with the added advantage of a certain degree of fire-resistance.

When cost considerations inhibit the use of treated lumber throughout, its use in those portions that are exposed to greatest danger of attack by insects and rot is considered good practice. These are the parts

of the structure in contact with the ground, in damp, poorly ventilated basements, or in contact with masonry. It is recommended that at least the timber foundation posts, girders, joists, sills, first floor plates, and sub-floors be Wolmanized. If the studding extends below the sub-floor, this, too, should be Wolmanized. Where sheathing and siding extend to the ground level, such material should be Wolmanized to a height of three or four feet.

Basement sleepers, flooring, coal bins, cellar stairs, etc., should be Wolmanized. For the complete protection of material in exposed locations (porch flooring, outside stepping, fencing, etc.) Wolmanizing is the surest protection.

"Destruction due to termites is estimated at 45 million dollars per year. The annual losses due to termites, fungi and similar agencies equals one-fifth of the value of the annual timber cut of the country. . . . Building lumber treated with Wolman Salts offers a solution to the problem and is a positive guarantee of protection against decay and termite attack."

—Frank D. Chase, Pres., Frank D. Chase, Inc.,  
Engrs. and Archts., Chicago.



*Wolmanized lumber provides the great advantage of permanent protection in homes of this type against decay and termite attack, and holds paint as well as untreated wood.*

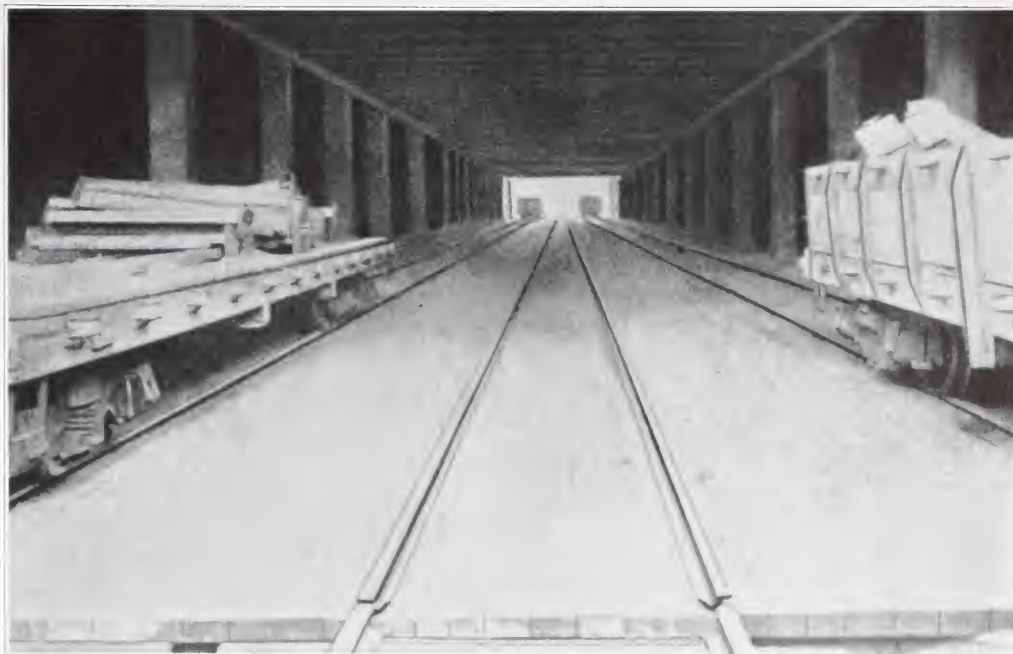
"BUILD TO ENDURE"

St. Louis  
Framing,  
derfloor  
door and  
frames,  
Trueblood  
A.



over the various substitutes on the market, but in still greater measure because of its high resistivity to heat transfer.

Another important characteristic of wood used for some of the elements of ice-house construction is its resilience, the capacity to take up shock of heavy loads without permanent deformation or abrasion. This capacity is lost to untreated wood as rot weakens the fibre structure. Wolmanized lumber, immune to decay, remains resilient for an economical period far beyond the comparatively short life-span of untreated wood in this type of service.



*Plant of Seaboard Refrigerating Co. at Jersey City, N. J. Wolmanized lumber used in sub-cellar floor.*



*Retail Ice distribution plant in conjunction with Season Ice Storage buildings which is typical of many where Wolmanized lumber was used throughout in construction.*





*The cost of protection in a home like this is so low that insurance against decay and termites through Wolmanizing is as imperative as fire insurance.*



*Building and loan companies insure their investments by requiring specification of Wolmanized lumber. The Jones Investment Corp., Los Angeles, had Wolmanized lumber used in this Cape Cod type home. Ulysses F. Rible, Architect.*





*This model home, built by the Allan Lumber Co., at Greencastle, Ind., was protected with Wolmanized lumber for less than 1% of the total cost.*



*Combination brick and frame residence, Dallas, Texas. Fully protected against decay and termites by the correct use of Wolmanized lumber.*

**"BUILD TO ENDURE"**





*The sparkling appearance of this dairy near Portland, Oregon, shows the advantages of Wolmanized lumber in situations where a clean, dry, odorless, paintable preservative must be used.*

## Farm Buildings and Fences

The amount of wood consumed in the construction of farm houses, barns, silos, sheds and fences represents a very large percentage of the annual lumber production of the United States. Today the farmer is dependent, for the greater part of his building material, upon lumber cut from second-growth forests, with a considerable proportion of sap-wood, so that, in ever-increasing extent, premature deterioration from decay and insect attack is occurring.

Preservative treatment of all wood entering farm service is economically imperative, but the treatment must be such that the material is clean, free from exudation or contaminating odors, and non-poisonous to live-stock. Wolmanized lumber in dairy barns and silos has proven that it is both decay and termite proof, yet does not contaminate feed or injure animals that come in contact with it. Commercial dairies which must be open at all times to governmental inspection find that Wolmanized lumber is the answer to the need for a protected wood that can be painted with

the assurance that the paint will stick and that there will be no subsequent exudation to ruin the paint film.

Only posts that are cut from live, sound trees are accepted for Wolmanizing, and they are carefully graded and seasoned before and after treatment. They are clean and safe to handle, and are harmless to live-stock. The economy attending a fence of Wolmanized posts is evident when it is seen that Wolmanized posts outlast native untreated wood posts from five to seven times.

Cris and bins, where feed and grain must be stored over long periods of time, when built of Wolmanized lumber are decay and termite proof, and do not taint the stored material. Feed troughs, pens, brooders, hen houses, when constructed of pressure-treated Wolmanized lumber, can be relied upon to maintain their original soundness for four or five times the life of untreated wood.

In the agricultural field, where profit margins vary so greatly from year to year, and costs of equipment must be amortized over long periods, Wolmanized material wherever wood is in danger of attack by decay and termites is the soundest insurance of the invested money.





*A farm can be beautiful as well as practical when Wolmanized lumber, permanent, paintable, clean, is used in its buildings.*

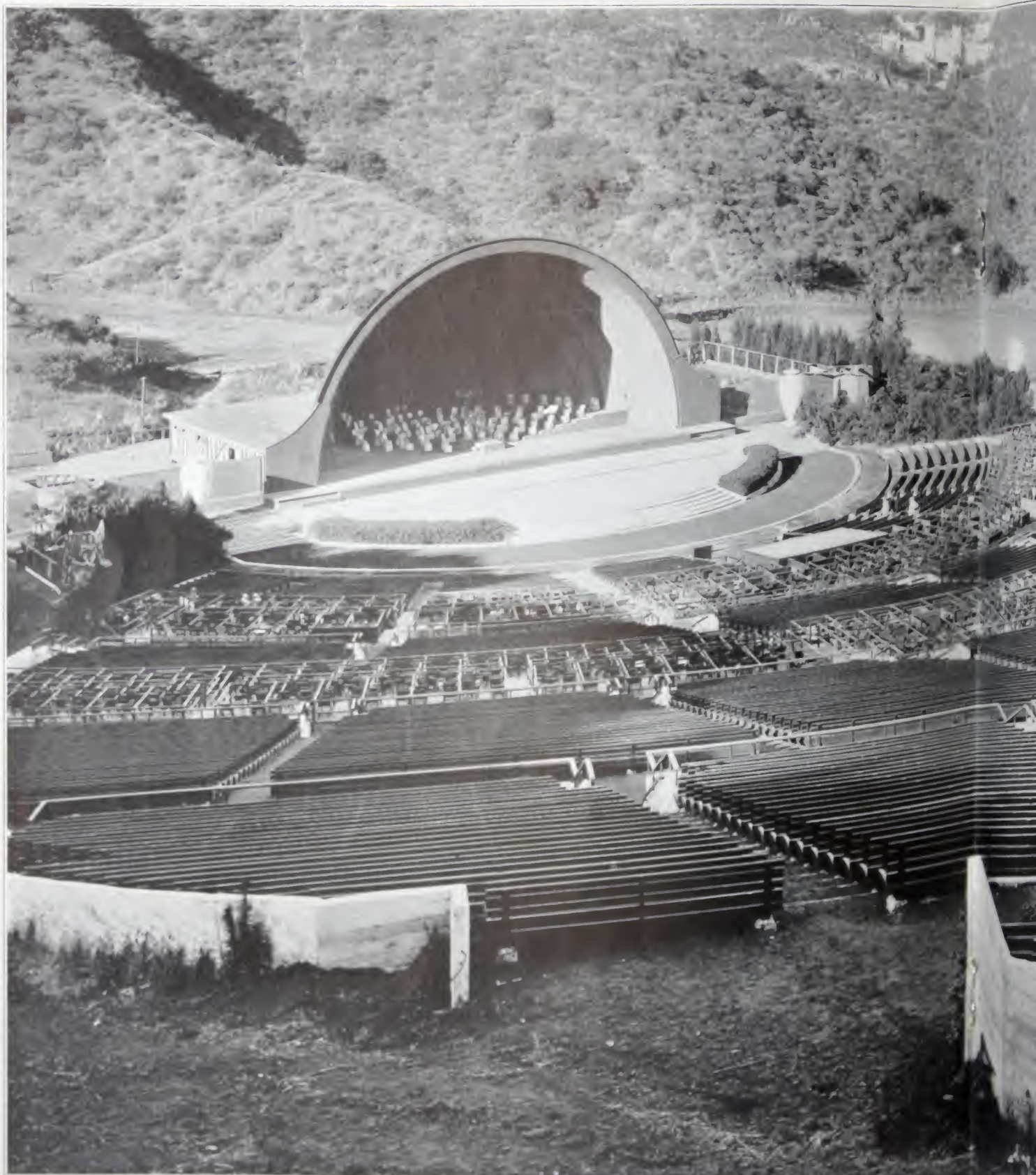


*A few of the hundreds of thousands of Wolmanized posts stocked by a large Southern manufacturer. Careful grading, treatment, and storage make Wolmanized posts that are the forward choice.*



*Clear, stout, straight posts, Wolmanized for permanence. The fifty-foot poles are also Wolmanized.*

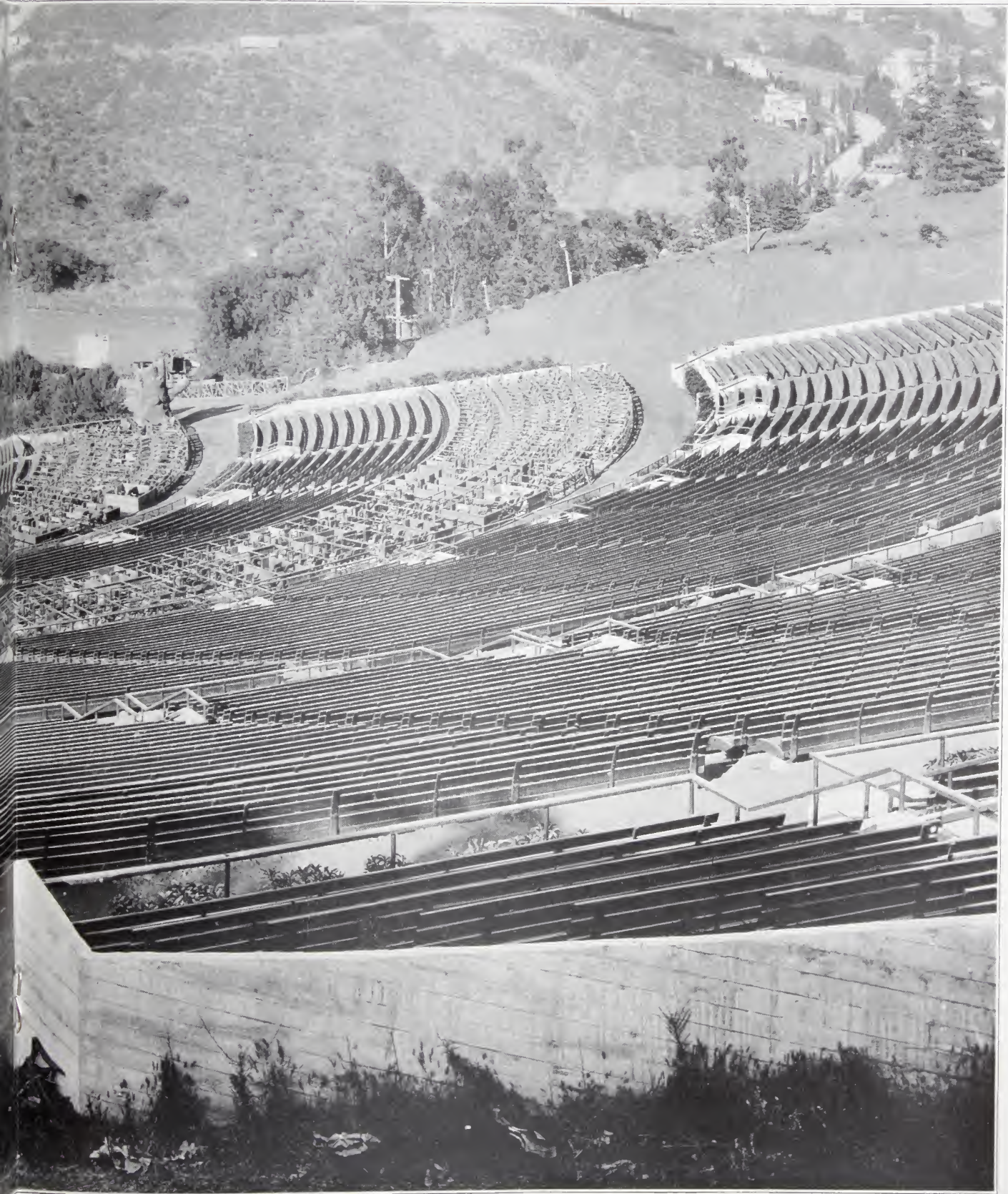




Hollywood Bowl, world-famous outdoor theatre, at Hollywood, California. When the original replacement, as the ideal material for this structure. Clean, dry, odorless, non-sanding, non-decaying material.

**"GOOD TO ENCORE"**

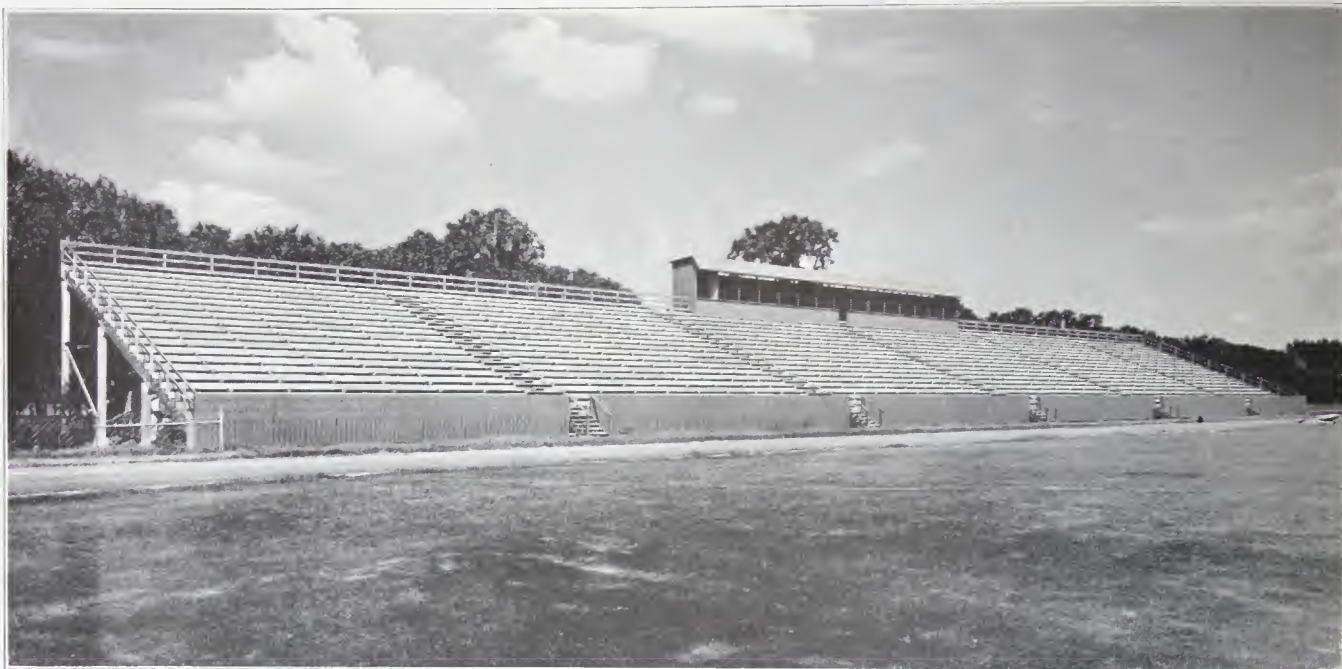




untreated material failed, the Hollywood Bowl Association turned to Wolmanized lumber for  
eaching Wolmanized lumber answers every requirement in outdoor theatres and stadiums.

"BUILD TO ENDURE"





*North stands of the Rice Institute Stadium, Houston, Texas. All seats, structural lumber and fence are Wolmanized.*

## Stadiums and Outdoor Theatres

Wood is the material generally used in the construction of stadiums, bleachers, and outdoor theatres. Year-round exposure to rain and sun allows rapid deterioration from decay if the material used is not treated. The treatment, however, must be of such

nature as to not only permanently protect the wood against decay and insects, but to be free from any exudation or creepage that will result in staining of spectators' clothing. It must in no way cause splintering or brooming of the seat.

Wolmanized lumber of the proper specifications is the perfect material for this purpose. It will not leach, can be painted, will not splinter or broom, and is entirely free from objectionable odor.



*Stadium seats of A. & M. College, Bryan, Texas, constructed of Wolmanized lumber.*

**"BUILD TO ENDURE"**





*The Wolmanized seats in this stadium will never rot, exude sticky preservative or develop unpleasant odors. Louisiana Polytechnic College, Ruston, La.*

*Permanent, practical bleachers and small stands can be built of Wolmanized lumber at reasonable cost. Wolmanized bleachers at Horace Mann High School, Gary, Ind*



*manized lumber. An ideal wood preservative for a structure of this kind.*

**"BUILD TO ENDURE"**





125,000 feet of Wolmanized Douglas fir was used in construction of this new Sound Stage at RKO studios, Hollywood.

## Schools, Theatres and Churches

Engineers in the field of acoustics have long been aware of the unique properties of wood which make it the ideal material in buildings in which sound dis-

tortion is one of the chief problems. The susceptibility of untreated wood to decay, insects and fire, however, had brought it into disfavor in view of the fact that buildings of this nature must be safe at any cost.

Wolmanized lumber, protected against its natural enemies, but retaining all its properties of strength, cleanliness, and sound absorption, is the answer to the requirements.



Will Rogers Memorial Sound Stage, 20th Century-Fox Film Corp., Los Angeles. 150,000 feet of Wolmanized lumber used in construction. McNeal Swasey, Architect.





*Holy Name School, New Orleans, La. Floor system constructed of Wolmanized lumber. Rathbone Debuys, Architect.*



*Twenty-eighth Church of Christ, Scientist, at Venice, California. Safety and durability assured by Wolmanized construction.*

"BUILD TO ENDURE"





*Jilamo Junction, Honduras, Cent. Amer. United and Standard Fruit Co. railroad platform and sheds Wolmanized.*

## Platforms, Sheds and Bins

Lumber and timber treated with Wolman Salts and used in the erection of such structures assures protection against decay and termite attack, eliminating the early deterioration of those parts exposed to the

weather, and avoids the expense of early replacements and repairs.

A number of railroads employ Wolmanized lumber in erecting their cotton and fruit platforms, while many manufacturing and industrial companies are using Wolmanized material for platforms in and around their buildings. This reduces the heavy maintenance expense of untreated material.



*Wolmanized freight transfer platform of Missouri Pacific R. R. at Houston, Texas.*



*Ice loading dock of Railway Ice Co., Kansas City, built of Wolmanized lumber.*

"BUILD TO ENDURE"



## Bridges

The constantly increasing federal, state, county and municipal expenditure in highway construction, necessitated by the constantly increasing automobile traffic, is proving a heavy financial burden upon the entire country.

Bridges over rivers, and for the elimination of grade crossings, constitute an important part of the several billion dollars expended in the United States on highway, street and grade crossing projects.

There is no such thing as "permanent construction," and this applies particularly to bridges. The obsolescence of bridges within ten or twenty years is an important factor to be considered in computing their cost and maintenance charges.

The so-called "permanent" bridge built of concrete and steel, may soon find itself far too narrow to

accommodate increasingly necessary traffic lanes. Or, it may have become out of line for practical purposes with the ever-shifting course of main traffic arteries in the present effort to relieve congestion. Therefore, new bridges must be built, and, in many cases, old ones abandoned or torn down.

Wolman Salts have been specified and used by leading bridge engineers for piling, timbers, ties, decking, guard rail, and other lumber entering into the construction of a large number of bridges in the United States and the countries of Central America.

Excellent results have been obtained by using Wolman Salts—at a total cost of lumber and treatment that is probably one-half of the same structural cost had the project been built in concrete or steel. By increasing the life of the untreated wood from an average of eight or ten years to thirty years or more, the annual charge for treatment is very light, and the economy of using wood, instead of material costing twice as much, is immediately apparent.



*Municipal Free Bridge, St. Louis, Mo., across the Mississippi River. Wolmanized Long Leaf Pine ties, timbers, planking and guard rails used in bridge and approaches, totalling over five million feet board measure. C. E. Smith & Co., St. Louis, Mo., Engineers.*





*Arkansas State Highway bridge, Pulaski County. Wolmanized throughout, from piling to brilliant white rails.*



*For lightness as well as durability, all lumber used in the left span of the Fore River bridge, between Quincy and Weymouth, Mass., was Wolmanized. Gen. S. Harkness, State Engineer. Vincent Barletta, General Contractor.*





*Michigan City Bridge (Franklin St., Michigan City, Ind.) All timbers including subflooring and sidewalk lumber Wolmanized. Scherzer Rolling Lift Bridge Co., Consulting Engrs.*

During the past few years a number of spectacular fires have occurred, causing destruction or serious damage to important bridges throughout the country. This has caused engineers to make a detailed study of the situation in order to overcome or minimize the fire hazard wherever possible. A number of these engineers have adopted the use of Wolmanized material; an example of which is seen in the Southern and Eastern Approaches of the Municipal Free Bridge at St. Louis, Mo., where Wolmanized ties and timbers, totaling over five million feet, were used in construction.

The element of weight is a most important one in steel bridge construction. The roadways and sidewalks, when built of cement, bitumen or other like materials throughout, add heavy weights which must be calculated by the engineer, and are reflected back into the carrier steel sections of the bridges, and the cost of those sections.

This is particularly true in the case of all types of lift bridges where counter-balances must be increased in weight considerably greater than the added weights of the surfacing materials; usually up to approximately three times the weight of the span.

The exclusive use of hard surfacing materials adds much greater weight than the use of Wolmanized wood subflooring, with a corresponding lessening of the quantity of the heavier surfacing materials. The usual bridge specification calling for oil treatment in bridge lumber or timbers is 12 pounds per cubic foot, or a weight of 1,000 pounds per 1,000 feet of oil-treated lumber, board measure.

In the case of the Tacony-Palmyra bridge across the Delaware River at Philadelphia, the engineers treated all of the wood used in the bridge with Wolman Salts, since the permanent added weight for this preservative material would be only 41 pounds per 1,000 feet board measure, of lumber treated, with some added weight caused by the addition of fire retardant salt.

The Standard Fruit & Steamship Co. have used Wolmanized material in the construction of bridges throughout their operations in Central and South America.

From an investigation recently made of these installations, it has been reported that all Wolmanized structures are entirely sound, with no sign of decay or rot, and that they are good for many more years of service.





*State Highway Bridge over Merrimac River, Fenton, Mo.  
All floor decking of Wolmanized 3x8" Yellow Pine.*



*Jutapa Bridge, Honduras, Central America. All material  
entering into this construction treated with Wolman Salts.*



*Tacony-Palmyra bridge, Philadelphia, Pa., spanning the Delaware River. Wolmanized fir lumber and timbers used in  
construction. Modjeski, Masters & Chase, Consult. Engrs., American Bridge Co., Gen'l Contractors.*





*Section of Coney Island (N. Y.) walk laid with Wolmanized 2x4 Edge Grain Douglas Fir. Installed by City of New York Highway Dept. C. E. Steiner, Engr. Borough of Queens, N. Y.*

## Boardwalks

All lumber used in beach boardwalks should be protected against decay, but the matter of fire protection is one to be carefully considered. The damp conditions at the seashore limit the life of untreated wood to an average of three to four years; a life exceeding fifteen years may be expected from boardwalks constructed of Wolmanized timbering and lumber.

Because of the disastrous fires which have visited Atlantic Coast playground resorts in recent years, consulting engineers of the Borough of Brooklyn conducted tests in 1925 which convinced them that a water-soluble treatment against decay, with a quantity of fire retardant salts added, would make boardwalk lumber sufficiently slow burning to enable the fire departments to extinguish all incipient fires in time to prevent a conflagration.

An all concrete boardwalk was prohibitive on account of cost, and the addition of fire walls which has been demanded by the fire department would have added nearly \$300,000.00 to the cost of the structure.

Accordingly, the Wolman Salts treatment was applied to the lumber used in one section of the Coney

Island boardwalk at an approximate cost of only \$12,500.00. This process has also been used in the several sections of the Rockaway Beach Boardwalk constructed by the Borough of Queens, New York City, under the direction of C. E. Steiner, Chief Engineer.

About twelve million feet of Wolmanized lumber has been used in these boardwalks to date.



*Section of Rockaway Beach (N. Y.) Boardwalk constructed of Wolmanized lumber, which when completed will be the longest in the World and will contain nearly 15,000,000 feet of treated lumber.*





*Under view showing of construction of Rockaway Beach Boardwalk. Piling and bents of reinforced concrete. Stringers 4x14" Wolmanized Yellow Pine. Flooring, 2x4" Edge Grain Wolmanized Douglas Fir. C. E. Steiner, Eng. Borough of Queens, N. Y.*

## Docks and Piers

The use of Wolman Salts pressure-treated lumber for docks and piers has, since its introduction, found a ready acceptance. Today, more than ever, materials protected by Wolman Salts against insect attack and decay are being used.

A large amount of Wolmanized lumber and timber was specified and used in the course of erection of wharves and cotton warehouses along the river front in New Orleans. The architects and engineers who wrote the specifications for this dock work, not only recognized the protection afforded to guard against



*Loading Dock, San Blas, Panama. Wolmanized lumber in framing, decking and superstructure of dock.*

**"BUILD TO ENDURE"**





*Wolmanized lumber deck of Jamaica Government Railway Pier at Kingston, Jamaica, British West Indies.*

decay and termite attack, but also considered the fire retardant qualities afforded by this treatment.

The Jamaica Government Railways at Kingston, Jamaica, British West Indies, specified and installed Wolman Salts timber and decking to replace older structures that had been destroyed by fire some time before.

The recognized severe risk of decay called for the use of treated lumber, while recent fire experience indicated the need for treatment that would result in a marked reduction of the fire hazard. A test made on Wolmanized lumber, that had been in railway service for some time, showed satisfactory fire protection, with both inflammability and combustion so retarded that the use of Wolmanized timber and decking for the construction of the deck of the pier was assured.

In Central America, the Standard Fruit & Steamship Co. has used large quantities of Wolman Salts treated material in the superstructures of many docks. Some of these have been in service for approximately twelve years.



*Wolmanized lumber in sheds and Wolmanized timbers on wharves erected by New Orleans Dock Board, New Orleans, La.*





*Wolmanized Timbering and Lumber in course of erection at Charbonnet Street Wharf, New Orleans, La. Installed by Port of New Orleans Dock Board.*

## Poles

Users of poles in all parts of the country are alive to the necessity of obtaining increased length of service from their poles. The Wolman Salts method of pressure treatment for preservation against decay and termites provides the ideal process for impregnating poles, with a positive factor of permanence, is at the same time economical, and involves no restrictions upon handling, utility or marketing.

There is no bleeding or leaching out of the preservative to affect the linemen or others who come in contact with

the poles. The fire hazard is noticeably reduced and the natural non-conductivity of the wood is not impaired.



*Carload of Wolmanized telephone poles to be installed by large Texas utility company.*



*Wolmanized poles in telegraph line extending out of La Ceiba, Honduras.*

**"BUILD TO ENDURE"**



Wolman Salts will penetrate areas in which fungi have developed, insuring that existing infection centres will be sterilized and all mycelia or spores in the wood killed. On the other hand the fibre fixation of the Wolman Salts is greater than that of any other preservative, while the very low solubility and freedom from hygroscopic effects of the ingredients insures a high degree of permanence.


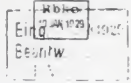
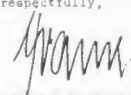
The German New Brunswick Transmission Line of 1913 is one instance of more than 20 years continental record of Wolmanized Poles, indicating a high efficiency and splendid utility in this field.

Wolmanized telegraph and telephone poles set out nearly twelve years ago for a distance of over 100 miles across the swamps and jungles of Honduras, Central America, on the property of Standard Fruit & Steamship Co., where the hazard of decay and termite attack reach the greatest intensity, are in sound condition today according to a recent thorough inspection.

The many installations in the United States, while made more recently, have met with unqualified approval. Repeat orders from these same users are an evidence of the outstanding advantages afforded in the treatment with Wolman Salts.



Geo. M. Hunt, in charge section of wood preservation, Forest Products Laboratory, Madison, Wisc., inspecting Wolmanized telegraph poles in Germany, after twelve years of service.

ÜBERLANDWERK BRAUNSCHWEIG G. M. B. H.			
<b>BRAUNSCHWEIG</b> Celler Strasse 84-85	Telegraph-Adresse: <b>ÜBERLANDWERK</b>		Formel 5408 u. 5404 Postfach-Nr. 875 Braunschweigische Staatsbank
<div style="border: 1px solid black; padding: 5px;">  </div>		<b>Ps.</b> Grubenholz-Imprägnierung G.m.b.H., Berlin - Charlottenburg 2 Hardenbergstr. 43.	
Ihre Zeichen Dir.R/B.	Ihre Nachricht vom	Unsere Abteilung Betrieb Fr. /Wd.	Tag 9. Januar 1929.
<b>Betreff</b> Triolith-Masten..			
<p>In reply to your letter of October 30th, 1928, we have undertaken an inspection in association with Mr. Grunert of the firm - Max Schulz &amp; Co., of the Triolith Poles placed in the year 1914, in the transmission circuits of Meerdorf, Dutenstedt &amp; Easinghausen.</p> <p>We are very glad to certify for you as a supplement to our certification of Nov. 12, 1924, that this renewed and most thorough examination has established the very excellent condition of these Triolith Poles put up in the year 1914, such that today, even after fourteen years of service, all of the poles are in perfect condition and give every evidence that many years of additional service are to be expected.</p> <p>The chart that you sent us sometime ago, we are returning to you, herewith enclosed, with our best thanks.</p> <p style="text-align: right;">Very respectfully,  ÜBERLANDWERK BRAUNSCHWEIG CORP. LTD.</p>			

# SIEMENS-SCHUCKERTWERKE

AKTIENGESELLSCHAFT

ABTEILUNG ZENTRALEN (AZ)

Drahtanschrift  
Wernitzel Berlin  
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C 4 Wilhelm Döll

Reichsbank-Girokonto  
Postcheckkonto  
Berlin Nr. 1469 der Siemens-  
Schuckertwerke A.G.  
Zentral-Verkehrsverwaltung

Ihre Zeichen  
Dir.R/B.  
Betreff

Ihre Nachricht vom  
7.6.33

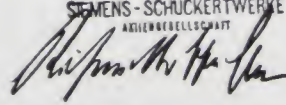
Unsere Zeichen  
1256

Berlin-Siemensstadt,  
11. August 1933.

(In der Antwort bitte angeben)  
**Re: Treatment of Poles with Wolman Salts.**

With reference to your letter of January 5th, 1933, addressed to our Director Dr. Werner, we beg to advise you that our first use of poles impregnated with Wolman Salts was in the year 1905. Then as these poles stood up well, others impregnated with Wolman Salts were installed in the same district in the years 1912 to 1926. The number of replacements that we have had with these poles since we have been using them indicates that we may depend on them for an average service life of 21 years.

Very respectfully,

**SIEMENS-SCHUCKERTWERKE**  
AKTIENGESELLSCHAFT  






*Bridge over 55 St. Viaduct, Cleveland, Ohio, erected by the City of Cleveland. White painted posts and railing of Wolmanized lumber.*

## Highway Posts and Guard Rails

Wolman Salts have established their utility in preserving highway posts, marker posts, sign posts and guard rails, and are being specified repeatedly by highway engineers.

Rigorous service conditions and the need of night

visibility demand a highly efficient treatment, and one that will permit satisfactory painting.

It is significant that installations already made have impressed engineers and construction crews with the cleanliness and ease of handling of Wolmanized materials, and with the superiority in paintability of Wolmanized posts over those treated with other preservatives which are less adaptable to this highway need.



*A series of bridges built by the Arkansas State Highway Department, showing how Wolmanized guard rails can be depended upon to hold paint under the severest conditions of exposure.*

**"BUILD TO ENDURE"**



## Car Material

That savings can be effected by the treatment of car lumber has been recognized and advocated by timber specialists, railway engineers, master car builders and railway executives. At the high cost of car lumber in place and heavy loss of earnings occasioned during the repair periods, it is safe to assume that the preservative treatment of car lumber will effect a much greater percentage of saving to the railroads and refrigerator car lines than is already being recorded by the millions of dollars saved annually through the treatment of cross ties.

Wolmanized car lumber offers to the railroads and refrigerator car companies an opportunity to escape the heavy toll they have for years been paying because of decay to rolling stock.

The small additional first cost of Wolman Salts treatment is absorbed during the first few years of a car's greatly extended life. The heavy losses long suffered from preventable decay of car lumber can be stopped at a relatively small increase in first cost.

What this potential saving means can perhaps be visualized by considering the fact that at a cost of less than 5 per cent of the original cost of a freight car, all the lumber entering into its construction can be Wolmanized, and by thus keeping it out of the repair shops and running in productive service, an average loss of approximately ten per cent of the gross car revenue can be averted.

TELEPHONE HARRISON 1833

### CENTRAL STATES EQUIPMENT CORPORATION

GENERAL OFFICES  
327 SOUTH LA SALLE STREET

CHICAGO

December 13, 1930

File B-200

American Lumber & Treating Corp.  
332 South Michigan Avenue  
Chicago, Illinois

Dear Sir:

Answering yours of December 10, regarding the present condition of Wolmanized lumber, which was installed in poultry car equipment during the year 1927.

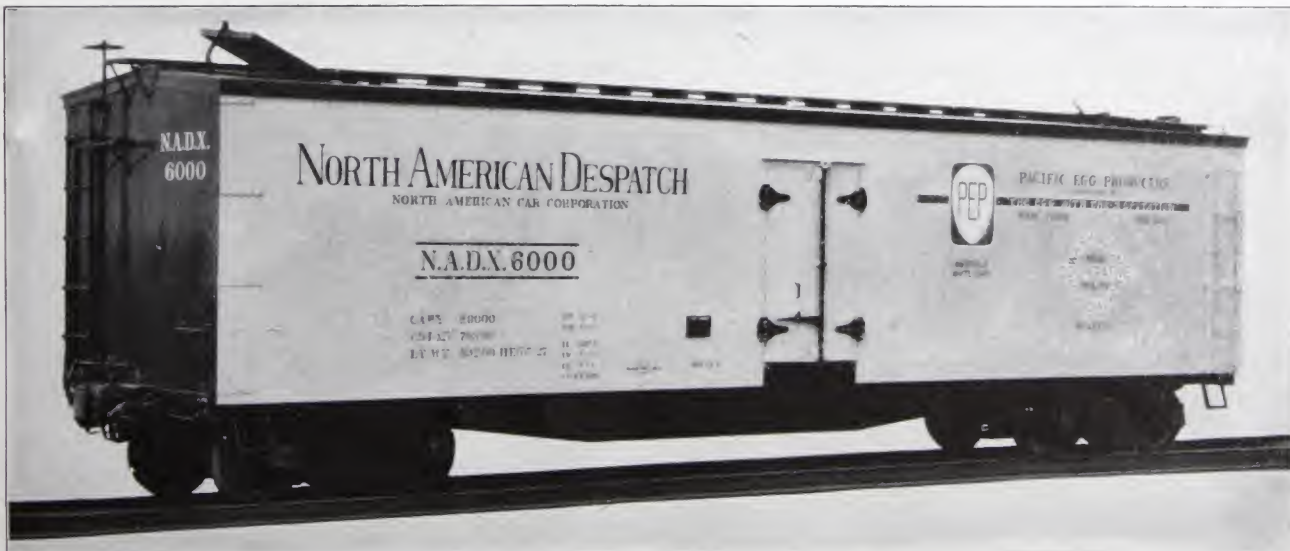
We have made some tests recently and find the wood in practically perfect condition. The test you and I made in 1927, where we immersed a piece of hard pine lumber which had been treated with Wolman Salts into a vat of poultry manure, holding a temperature of 70 degrees, for nine months, at the end of which time the wood was removed, washed off and found showing no signs of decay, was what we call our accelerated test and would be equivalent to about five years' service.

Poultry equipment, as you know, carries about 4500 fowl per load and the manure, together with the feed which becomes spilt more or less, accumulates approximately 1500 pounds per car per trip. This, of course, means at this time of year an approximate moisture of 60%, while in the summer months it drops as low as 35%. The average amount for the year, however, is 1500 pounds of raw manure. The ammonia, together with other acids or fumes, in connection with the heat from this amount of poultry, seems to create a warm, damp atmosphere or in other words a high humidity and, when settling against the roof just inside the side plate which forms a pocket, this creates a condition of dry rot. In many cases tests have been made where the paint seemed to be intact but after two years, when breaking through the paint film, the best wood we could obtain could be easily dug out with a pen knife blade. However, lumber treated with Wolman Salts in 1927, as previously explained, we find to be still intact.

Yours truly,

*L. S. Barr*  
Mech. Supt.

LSB:HC



Wolmanized car decking, lining, siding, roofing, sills and framing for freight cars of the above type and others, will give satisfactory service. The records already established for this treatment afford definite assurance of marked savings in costly renewals.

"BUILD TO ENDURE"





*Banana cars built of untreated lumber have short life in Central America. Those of Wolmanized material, like the above, will give long service.*

Statistics indicate that the loss of time for repairs amounts to one month per car out of each year of its running time. The average thirty day haul will produce a revenue of about \$500.00, while on the other hand 80 per cent of the car repairs have been shown to be due to decay of the timber.

The indirect saving in addition to the direct expense can be set at not less than \$400.00 per year during the entire period of service.

The direct cost of each annual trip to repair shops can not be much less than \$100.00. That a single charge item of less than \$100.00 per car can produce an annual saving of some \$500.00 for each one of the 1,500,000 freight cars in service, is an element that demands prompt and decisive action.

The parts of freight cars that it is most necessary to preserve chemically are the sub-sills, nailing strips, posts, braces, and roofing of box cars; the entire wood substructure, interior framing and superstructure of refrigerator cars; practically all of the wood in stock

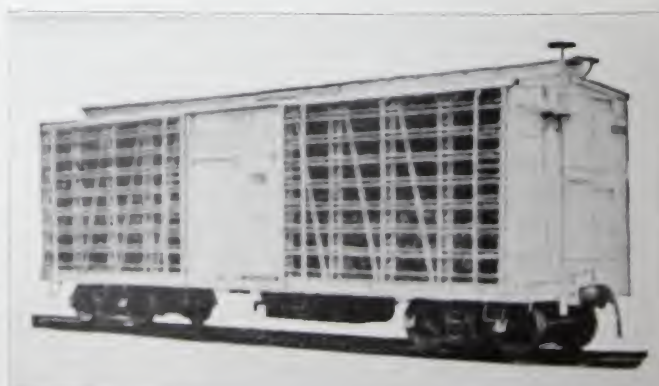
cars and coal cars; the decking and timbers in the substructures of flat cars and even caboose and similar cars provide opportunities for the employment of treated timber.

There are, it is true, incidental problems to be solved due to changing over to the use of treated lumber in car construction. However, there is no change required in the design of building detail because adaptation can easily be made. The engineers can be relied upon to readjust quickly matters of shop program when the opportunity of stopping the heavy and needless waste in wooden car construction is made clear to them.

There have been a number of installations of Wolmanized lumber among the several railroads, car shops, car companies, and refrigerator lines. The experience thus far obtained with Wolman Salts treated wood parts in freight cars, refrigerator and poultry cars justifies our claim that large savings can be made when the treatment is properly applied, and judiciously used.



*Wolmanized ties, car material and lumber, in yard of car shop of Standard Fruit & Steamship Co., LaCeiba, Central America.*



*Wolmanized wood car parts in poultry freight cars have already demonstrated their ability to save costly replacements.*

**"BUILD TO ENDURE"**



## Mines

Although the cost of timbering must be included as one of the major items of expense in nearly all mines in the United States, this problem has, somehow, not received much executive attention until very recently in the campaign of mine owners to cut down the operating costs, increase production, and prevent all avoidable losses in maintenance.

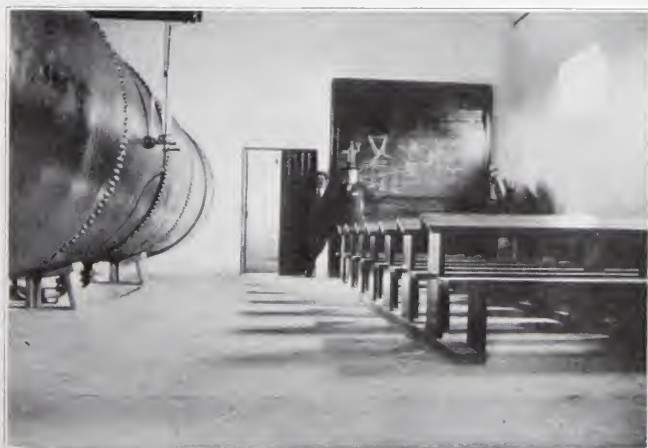
The practical steps to be taken must originate with the executives and engineers responsible for the administration of mining properties, because the idea is a radical departure from established practice.

The decay of mine timbers is one of the major items of cost in the operation of all mines, whether coal or metal. Mine managers have always been aware of this great tax upon the industry, but have been compelled to bear the heavy burden—one that has been increasing from year to year. As long as cheap nearby timber was available, the problem did not appear to be a very serious one, although the use of a suitable preservative would have extended the life of the timber five or six times.

For nearly 30 years, Wolman Salts have been used in Central Europe in mines, and the results have been so satisfactory that over 80% of all mine timber treatment in Central Europe is accomplished with Wolman Salts.



*View in European mine. Untreated timbers in foreground, notably a, b, c, show advanced fungi attack after two years of service. Those in background treated with Wolman Salts, show no infection after seven years.*



*Schoolroom in Germany installed alongside of Wolmanizing retort, gives evidence of cleanliness and freedom from odors.*



*Timber yard in front of the Wolmanizing plant of a Silesian Mine. This mine has been using Wolman Salts since 1922.*



# RYBNICKIE GWARECTWO WĘGLOWE RYBNIKER STEINKOHLLEN-GEWERKSCHAFT

Adres telegraficzny:  
Rybnikwerk Katowice

Telefon:  
Katowice Nr. 217, 231, 322, 791.

Oddział:  
W odpowiedzi należy podać oddział

KATOWICE, dn. 17. IX. 1932.  
ul. Powstańców 41  
Skrytka pocztowa 100

Messers.  
The International Lumber & Tie Company  
Chicago, Ill.  
861 McCormick Bldg.

Subject: Wolman Salts.

Gentlemen:

Thanking you for your favour of April 13th, which was received on 26th ult., we beg to inform you that since 1908 we are working according to the Wolman process with very good success. On account of our extremely good experience with this method we have erected especial treating plants System Wolman on all of our different mines, which up to date are all in operation.

As our running supervision has shown, that the life-time of wolmanized lumber is 8 times that of untreated wood we have adopted the Wolmanizing process throughout where the mine pits are exposed to premature deterioration by damp.

Trusting to have served you with this information, we remain,

Yours truly

Rybnickie Gwarectwo Węglowe  
Rybniker Steinkohlen-Gewerkschaft

*[Handwritten signature]*



Treated



Untreated

*A Wolmanized prop in perfect condition after ten years service, compared to an untreated piece badly decayed after only ten months service.*



*View of German Wolmanizing plant treating material to be used in mines exclusively.*

"BUILD TO ENDURE"

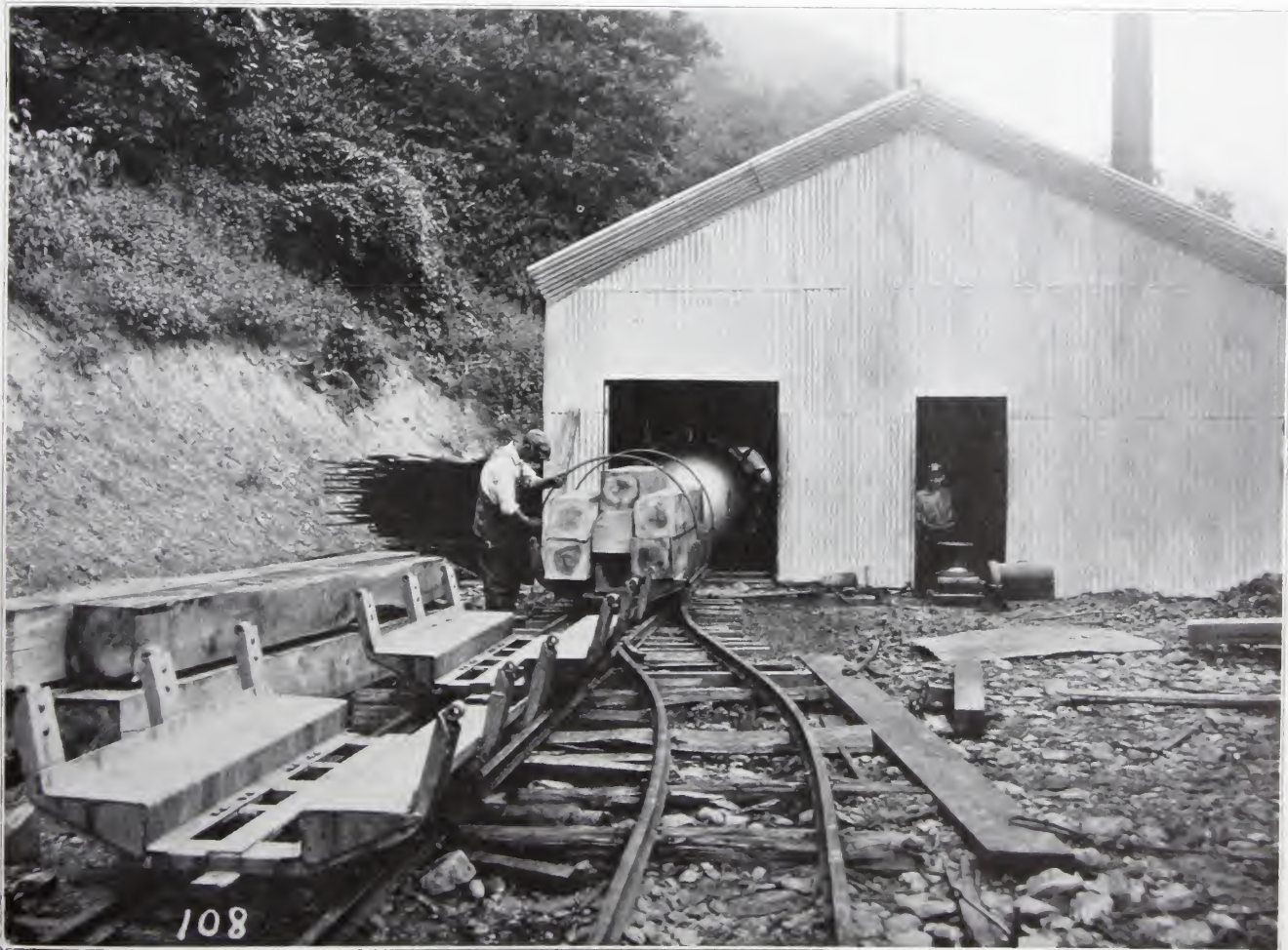


Wolmanized mine props and timbers are fire resistant. They will not carry flame, so that fire started from any cause will not result in conflagration. Wolmanized mine timbers do not ignite from explosions, and many disastrous mine fires would have been eliminated had the mine been timbered with Wolmanized material.

Nearly 100 treating plants in the mining districts of Central Europe use Wolman Salts exclusively. Wolman Salts have become the accepted standard preservative for mine use in Europe and with this long satisfactory record of service in Central Europe, can be used by the mines in the United States with absolute assurance of good results, and the life of the treated material increased many times over that of untreated.



*Wolmanizing plant and timber yard of Hibernia Mining Corp. at Herne.*



*A typical Wolmanizing plant in use at one of the mines in West Virginia. Suitable for use by mines or other large industrial corporations for the preservation of lumber and timber for private requirements.*



Although the need for preservation of all wood going into the subsurface workings is admitted to be important, the savings that can be realized in treating surface construction material must be taken into consideration. In surface structures such as headframes, shaft houses, breakers, tipples, ore bins, tramways, trestles, flumes, shops and other mine buildings, the average untreated life is about six or eight years, in more or less damp locations. If Wolmanized, these structures can be counted on for from three to four times that length of life.

In the simple matter of dollars and cents, the use of Wolmanized lumber above as well as below ground is sound operating practice.



*Pony timbering prefabricated and Wolmanized by the Green Spring, Va., plant of the Wood Preserving Corp., for the Berwind-White Coal Mining Co., at Windber, Pa.*



*Main heading, Eureka Mine No. 37, of the Berwind-White Coal Mining Co., Windber, Pa. All material prefabricated and Wolmanized by the Green Spring, Va., plant of the Wood Preserving Corp.*



# Gutehoffnungshütte

Oberhausen Aktiengesellschaft

AGGREGAT  
Bismarckstr. 10, 3300 Bielefeld  
Telefon: 11111  
10-11 Uhr vorm., außer Sonntage

AGGREGAT  
A. B. C. Code 10, am Edison  
Bismarckstr. 10, 3300 Bielefeld  
Telefon: 11111  
10-11 Uhr vorm., außer Sonntage

AGGREGAT  
A. B. C. Code 10, am Edison  
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Bismarckstr. 10, 3300 Bielefeld  
Telefon: 11111  
10-11 Uhr vorm., außer Sonntage

International Lumber & Tie  
Company,  
Chicago, Ill.  
861 McCormick Bldg.

Ihre Abt. u. Zeichen

Ihre Schreiben vom

16. Juli 1932

Ihre Abt. u. Zeichen

(in der Antwort angeben)

B.A. I/II

Ihre Abt. u. Zeichen

(in der Antwort angeben)

Wood Impregnation.

Oberhausen Rheinland, den 13. August 1932.

In reply to your letter of July 16th, 1932, we have for more than 20 years been impregnating the timbers used in sections where there is an outgoing air current with very satisfactory results.

Since 1924, we have been making use exclusively of the Wolman Salts (Gluckauf-Basolith extra (Triolith)). We impregnated in accordance with the familiar vacuum-pressure method.

Our experiences have shown that treated wood set in places with outgoing air current will last about 10 years longer than untreated timbers. The cost of impregnation runs about 10 marks per cubic meter (8¢ per cu. foot or \$6.25 per M B.Ft.).

GUTEHOFFNUNGSHÜTTE,  
OBERHAUSEN AKTIENGESellschaft

*Ernst, Bielefeld*

DEUTSCHE SOLVAY-WERKE  
ACTIEN-GESELLSCHAFT  
BERNBURG

BERNBURG DEN. September 21st 1932

International Lumber & Tie Company,  
861 McCormick Bldg.,  
Chicago, Illinois.  
Re: Wolman Salts.

To your inquiry of the 23rd of July, 1932, we beg to reply as follows:

In the year 1913 we received from the Grubenholzimpregnierung G. m. b. H., Berlin W. 35, drawings and data for the construction of a treating plant according to the Wolman System. However it was not until the year 1924 that we actually proceeded with the erection of the plant. Since then we have operated exclusively according to the process of the Grubenholzimpregnierung Corporation, with the Wolman Salt Triolith.

The timbers that we treated in 1924 with Wolman Salts have remained in good condition to date, and have not required the end of their service life. We install Triolith treated timbers in the haulage ways and where there are outgoing air currents. At points where there is much movement and heavy pressure the use of treated timber is not to be recommended.

The method of treatment consists in first keeping the timber in a closed retort, for one hour under vacuum, and then after introduction of the treating solution, under a pressure of 60 pounds per square inch for an hour. In making up the treating solution with 10 pounds of salt to each 50 gallons of water (2.35 % - K.).

We trust that the above data will be of service to you.

Very respectfully,  
German Solvay Works Corporation

*Harung*

## Grubenholzimpregnierung

Telegramm-Adresse  
Impregnierung Berlin

Gesellschaft mit beschränkter Haftung

WOLMAN-SALZE

Fernsprecher:  
Samml.-Nr. B 1 Kurbf. 2103

Giro-Konto:  
Reichsbank Charlottenburg

Postfachkonto: Berlin Nr. 2993

Abteilung: C/B

Nr. 165

BERLIN W 35, den 22.9.32  
Lützowstr. 33/34

Betreff: Zeugnisse

An die  
American Lumber & Treating Corp.,  
532, South Michigan Avenue,  
Chicago 5, Ill.,  
U.S.A.

We take this occasion to thank you for the communication sent to us under date of the 13th of August regarding this same subject with reference to the timbers of the A. B. C. Co. of Chicago, and the A. B. C. Co. of Chicago, and the A. B. C. Co. of Chicago.

As to the latter concern, we beg to inform you that the timbers of the A. B. C. Co. of Chicago have been impregnated with our salt Triolith, and that it is our regular business to impregnate timbers with the same "Gluckauf-Basolith extra", which is a term quite generally used in the mining industry for treating timbers. You understand of course that the timbers concern was liquidated the month of March 1931, under the control of the I. O. O. F. of America, and that the latter owns outright the majority of the shares of stock of the Sieben Company.

We might remark to this connection that the use of wood preservatives in recent years on the part of the mining industry has been very much less than formerly, since they are doing practically all the work of impregnation. You perhaps have in mind the large concern that used the same timber treatment as we in July 1931, took over for treating material in the month of July 1931, and that the latter was a few thousand pounds of salt. We have sent to you this to your attention.

We have noted that the International Lumber & Tie Company, with the reply received from the Sieben Co. for the treatment of the timber, and that they used for the treatment of their timber, if you can arrange to secure copies of the further correspondence between them, we shall greatly appreciate your letting us know about the results.

Very respectfully,

*Stellvert.*

Bergwerksgesellschaft Diergardt-Neuhausen  
mit beschränkter Haftung

Fernsprecher:  
An der Grubenholzimpregnierung G. m. b. H., Berlin W. 35  
An der Grubenholzimpregnierung G. m. b. H., Berlin W. 35  
An der Grubenholzimpregnierung G. m. b. H., Berlin W. 35  
An der Grubenholzimpregnierung G. m. b. H., Berlin W. 35

Postfachkonto: Berlin Nr. 2993

Abteilung: C/B

International Lumber & Tie Company,

Chicago, Ill., U.S.A.  
861 McCormick Bldg.

Concerning: Impregnation of mine timber - Your letter of July 25th.

In courteous reply to your above mentioned communication, we beg to inform you that since 1924, we have been impregnating with Wolman Salts all of the mine timbers used in our Wilhelmine Neuhäuser mine that is placed in outgoing air passageways as well as in our main hallways.

The experience with this impregnation we consider satisfactory.

As to the life of treated timber compared to untreated mine timber, beg to say that installation made in 1925 are still entirely sound and from appearances will remain serviceable for many years to come.

Untreated mine timbers, according to previous experiences, in these locations has to be replaced in one or two years.

We trust that the above information will be serviceable to you.

Very respectfully,

*Reichard*



## Railroad Ties

The Wood Preserving Industry is indebted in large measure to the railroads for the original impetus that led to its successful development. Their extensive use of preservative treatment for cross ties has been primarily responsible for the progress made from the early experimental stages to the present high degree of efficiency in application, and has served to establish beyond question the economic value of wood preservation. On the other hand, the railroads themselves have derived great financial benefits.

The detailed cost accounting carried by the maintenance departments of the railroads furnishes dependable records not only for comparison of treated ties with untreated ties but also for comparison of the service life secured by different methods of treatment.

Such comparative records, over a period of over twenty years of practical service, provide convincing assurance of the adaptability of Wolman Salts for the treatment of cross ties; and examination of many Wolmanized ties taken out of track after long years of service in positions of particularly severe exposure, a condition favoring decay, have shown decided advantages over other processes of preservative treatment. The freedom from heart rot, the maintenance of the original elasticity and resilience of the wood with correspondingly maintained grip on spikes, the lack of corrosion of metals in contact with the tie so that there was no softening of the wood around the spikes or under the tie plates, and the absence of any checking or brooming, are strikingly demonstrated.



*Wolmanized ties in tracks of the German Government Railways installed in 1915, have made a fine record of preservation.*



*Geo. M. Hunt, in charge of Wood Preservation, Forest Products Laboratory, Madison, Wis., making close investigation of Wolmanized ties installed in German State Railway.*

The German Government Railways installed 1,180,000 Wolmanized ties in their lines in various parts of Germany, most of them in the spring of 1915. These were standard main line ties of Baltic Pine, treated with recorded net retentions ranging from 0.16 to 0.22 pounds of Wolman Salts per cubic foot.

On account of a formal guarantee of replacement for any decayed ties over a twelve-year period, close record of the installations was kept, and periodic inspections were made.

At the end of twelve years, in 1927, the final inspection under the guarantee disclosed that no replacements were required under the contract, nor had any been demanded or appeared necessary at any of the previous inspections. A report by Engineer Mathey, in charge of tie and timber treating for the Government, stated that from the observed condition at least another ten years of service could be expected.

Now, at the end of 21 years of service there has been only a small percentage of these ties replaced. They were generally distributed as out of face installations of from 40,000 to 50,000 or more in different lines in all parts of Germany, some of them where past records had shown conditions to be exceedingly favorable to decay. Even in the worst locations there have been only insignificant replacements needed.

Close scrutiny during an inspection made in 1935 showed that there was a minimum of checking in the Wolmanized ties, in fact decidedly less than in ties



Name of Railroad	Date Installed In Track	Number Installed	Kind of Tie	Preservative Used	Replacement Necessary
Ryomgaard-Gjerrild Railway	Dec. 5, 1911	42,000	Pommeranian Pine	Standard Creosote	8 yrs. 1% 9 yrs. 2% 10 yrs. 3% 11 yrs. 4% 12 yrs. 7% 13 yrs. 10% 14 yrs. 11% 15 yrs. 12%
Hornbaek-Gilleleje Railway	July 11, 1916	14,600	Swedish Pine	Wolman Salts "Triolith"	11 yrs. Less than 1%
Faaborg-Svendborg Railway	Nov. 24, 1916	33,300	Swedish Pine	Wolman Salts "Triolith"	10 yrs. none
Gjerrild-Gronan Railway	June 26, 1917	21,000	Swedish Pine	Wolman Salts "Triolith"	9 yrs. none
Troldhede-Kolding-Vejen Railway	Aug. 25, 1917	98,000 50,800	Riga Pine Swedish Pine	60,800 Wolman Salts "Triolith" 88,000 Creosote	9 yrs. none
Varde-Grindsted Railway	April 12, 1919	62,000	Swedish Pine	5,200 Wolman Salts "Triolith" 56,800 Creosote	None
Kjoge-Ringsted Railway	Aug. 4, 1917	47,541 4,517	Swedish Pine Swedish Pine	Wolman Salts "Triolith" Untreated	10 yrs. 0.06% Several Hundred

## ACTUAL SERVICE RECORDS OF WOLMANIZED TIES IN DENMARK

*Taken from the Annual (May, 1927) Report of Engineer A. Collstrop, Danish State Railways.*

treated with oil preservative, of the same age, immediately adjoining.

Another striking study of comparative durability is offered by a report presented by Engineer Collstrop, dated May, 1927, for ties treated with various preservatives in service in the lines of Danish State Railways. Typical excerpts from this report are tabulated above.

The first supplementary report on a portion of these ties, has been received, dated July 28th, 1932, from Copenhagen, and covers the lot placed in the Kjoge-Ringsted lines, the last item shown in the original tabulation above, and reads as follows:

"This date the Wolmanized ties in the Danish Railways Kjoge-Ringsted lines were reinspected. These tracks were laid in 1916 and 1917 with 47,541 pine ties that have been impregnated with a 1% solution of the Wolman Salts Triolith. The track has 60 pound rails on tie plates and is secured with spikes.

Of the 47,541 ties installed there have been to date 350 replaced, that is to say only  $\frac{3}{4}$  of 1% (0.75%). The ballast is a fine gravel and the ties were largely covered over by the earth. After a large number had been uncovered and examined the finding was that the surface showed weathering effects to a depth of 1/16th to 1/8th inch and that all the wood

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
FOREST PRODUCTS LABORATORY

ADDRESS REPLY TO  
DIRECTOR  
AND REFER TO  
RPLZ

MADISON, WISCONSIN  
November 23, 1927.

Mr. John G. Kreer,  
American Wood Impregnation Corp.  
25 Broadway,  
New York, N. Y.

Dear Mr. Kreer:

I am enclosing a copy of an article on timber impregnation by A. Collstrop of Denmark which we have just had translated from the Danish. You will note that it refers in several cases to the use of ties treated with Triolith. I am not sure that the various mixtures which he used during the war would now be considered as conforming strictly to the formula for Triolith. Nevertheless they were sodium fluoride dinitrophenol mixtures and I believe he obtained them from Wolman. Perhaps Wolman could say exactly what the formulae contained. Whatever they were, however, they have given a fairly good account of themselves thus far and I consider them additional evidence in support of the statement which I have been making for the past year that Triolith will give good results in railway ties and other timbers when it is employed intelligently.

Enclosure:  
1 report

Very truly yours,  
GEO. M. HUNT, In Charge,  
Section of Wood Preservation.





*Removing ballast for examination of Wolmanized ties in German Government Railway tracks. After 21 years service a very small percentage removed account of decay. Balance in excellent condition, promising many more years service.*

underneath was absolutely sound and in healthy condition. As a result of the inspection the further service life expectancy of these ties is set at at least an additional ten years."

Others amongst the older installations of Wolmanized ties that are contributing to the record of the efficacy of Wolman Salts in service are:

386,000 Triolith treated ties in the lines of the Swedish Government Railways, since 1916.

240,000 Triolith treated ties in the lines of the Federated Railways of Switzerland, since 1916.

Chemins de Fer & Minieres Prince Henri, at Luxembourg, writes:



*Wolmanized ties being installed in track in Standard Fruit & Steamship Railway operations in Honduras.*



*Wolmanized ties under track through Central America Banana Plantation, where Wolman Salts have been found to be the best preservative for extremely severe conditions.*

"... since 1916 we have been using the material Triolith for the impregnation of our railroad cross ties. The results both for Oak and for Beech ties have been very satisfactory."

"... replying to your letter of August 8th, 1932, we have the honor to advise you that while we have not kept any special records of the ties treated with the Wolman Salts yet there are still in service in our tracks a considerable portion of those treated in 1916."

In tropical countries, where the exposure to conditions favoring decay is very severe, the largest single installation of railroad ties treated with Wolman Salts is that of the Standard Fruit & Steamship Co. in Honduras, which over a twelve year period has made a striking record of the efficacy of the Wolman





*Wolman Salts in Bridge Ties and all other Timber of the Municipal Bridge, Southern Approach, St. Louis, Mo., provides protection from both Decay and Fire.*

Salts under the extreme of bad conditions, in comparison with the results secured from the use of other preservatives.

A thorough general inspection made in the spring of 1933 shows that there has been only a negligible amount of replacement, and comparatively little attack by decay. The decay that was found, was confined to the ends of the ties located in marshy lowlands and **did not progress into the interior or heart wood**, as was commonly experienced under similar conditions with preservatives previously employed.

The best evidence of the real substantial success of any product is the satisfied customer. The continued use of Wolman Salts for the treatment of ties by the Standard Fruit & Steamship Co. after twelve years

service experience, and twenty-one years of records with the best of other means of preservative treatment for comparison, is a **splendid endorsement of the adaptability of Wolman Salts for the preservative treatment of railroad ties even under the most severe conditions of exposure.**

Installations of Wolmanized ties have been made in various localities of the United States during the twelve years since the introduction of Wolman Salts, but for the milder service exposure these have not been in track long enough as yet to provide conclusive records such as the European and tropic installations above mentioned. They are giving a good account to date and it is expected that they will ultimately provide just as convincing evidence as the older service records cited.



# Treating Facilities and Distribution

**W**OLMANIZING facilities are available at a number of large sawmills, where pressure treatment with genuine Wolman Salts is part of the mill service.

**O**WING to the cleanliness and dryness of Wolmanized material, these mills can ship Wolmanized lumber, posts and timbers in mixed cars with untreated items, or in straight carloads.

**L**ATEST type dry kilns, built to American Lumber & Treating Company specifications, and designed to bring Wolmanized lumber to the proper moisture content quickly and safely, are installed at mill treating plants for proper conditioning of Wolmanized material.

**M**ERCHANDISING of Wolmanized lumber by these mills is carried on through their regular channels, making Wolmanized forest products readily available to retail dealers.

**A**NUMBER of commercial treating plants are licensed and equipped to treat under supervision of the American Lumber & Treating Co., with genuine Wolman Salts preservatives, which are marketed by the American Lumber & Treating Co., and protected by its U. S. patents. Located at strategic points throughout the United States, these plants can be relied upon for dependable service, and will quote prices on lumber and treatment and also on treatment of material in transit.

**N**AMES of treating plants best suited to serve any certain territory will be given upon application. Quotations can also be secured from many local lumber yards, some of which carry stocks of lumber treated with Wolman Salts, dry and ready for immediate use.

## AMERICAN LUMBER & TREATING CO.

37 WEST VAN BUREN ST., CHICAGO, ILL.

NEW YORK, N. Y.

122 E. 42ND ST.

SHREVEPORT, LA.

509 MARKET ST.

BOSTON, MASS.

10 HIGH ST.

SAN FRANCISCO, CAL.

RIALTO BLDG.

GAINESVILLE, FLA.

E. JACKSON ST.

ST. LOUIS, MO.

ARCADE BLDG.

LOS ANGELES, CAL.

1031 SO. BROADWAY







